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ABSTRACT

The purpose of this study was to determine if measures of first grade readiness, scholastic aptitude, and reading achievement were significant predictors of third grade reading achievement for Mexican-American students from two lower socioeconomic levels. The sample included 94 third grade students for whom the following measurements had been obtained: (1) Metropolitan Readiness Test (MRT) administered at beginning of first grade; (2) Metropolitan Achievement Test Primary Battery (MAT) administered at completion of first grade; (3) California Test of Mental Maturity (CTMM) administered at completion of first grade; (4) Metropolitan Achievement Test Elementary Battery administered at completion of third grade; and (5) socioeconomic classification obtained from the "Two Factor Index of Social Position." The conclusions derived from the study were that (1) CTMM Non Language, CTMM Total Data, and MRT Numbers could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American boys from lower socioeconomic levels; (2) CTMM and MRT Total Data could be considered as meaningful predictors of the end of third grade reading achievement for Mexican American students from Social Class IV; and (3) CTMM Total Data, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total Data, MRT Sentences, MRT Copying, and MAT Reading could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American girls from Social Class IV. (HBC)

PREDICTING THIRD GRADE READING ACHIEVEMENT FOR MEXICAN-AMERICAN STUDENTS FROM LOWER SOCIOECONOMIC LEVELS

BY

FRANCES ANN BENNETT STEVENS, B.S., M.A.

A Dissertation submitted to the Graduate School
in partial fulfillment of the requirements
for the Degree
Doctor of Education

Major Subject: Counseling and Guidance
Related Area: Reading

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"Predicting Third Grade Reading Achievement for Mexican-American Students from Lower Socioeconomic Levels," a dissertation prepared by Frances Ann Bennett Stevens in partial fulfillment of the requirements for the degree, Doctor of Education, has been approved and accepted by the following:

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Problem. The central purpose of this study was to determine if measures of first grade readiness, scholastic aptitude, and reading achievement were significant predictors of end of third grade reading achievement for Mexican-American students from two lower socioeconomic levels. A subsidiary purpose of the study was to isolate the most potent predictor variables of end of third grade reading achievement.

Design. The study setting was Las Cruces School District Number Two, Las Cruces, New Mexico.

The sample included 94 third grade Mexican-American students for whom the following measurements had been obtained: (1) Metropolitan Readiness Test (MRT) administered at beginning of first grade, September 1967; (2) Metropolitan Achievement Test Primary Battery (MAT) administered at completion of first grade, May 1968; (3) California Test of Mental Maturity (CTMM) administered at completion of first grade, May 1968; (4) Metropolitan Achievement Test Elementary Battery administered at completion of third grade, May 1970; and (5) socioceonomic classification obtained from the Two Factor Index of Social Position (Hollingshead, 1965).

The criterion variable of third grade reading achievement consisted of a composite reading achievement score derived by combining the standard scores received by an individual on the MAT Elementary subtests of Word Knowledge, Word Discrimination, and Reading. The thirteen predictor variables were: MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, and CTMM Total Data.

A significant relationship between the thirteen predictor variables and the criterion variable was hypothesized for the following groups: (1) total sample; (2) total sample of boys; (3) total sample of girls; (4) total sample of Social Class IV; (5) total sample of Social Class V; (6)

total sample of Social Class IV boys; (7) total sample of Social Class IV girls; (8) total sample of Social Class V boys; and (9) total sample of Social Class V girls. To isolate the variables which were the most potent predictors of third grade reading achievement, a step wise multiple regression analysis was performed for each of the above sub groupings.

The data obtained in this study were reported for each sub group and included: (1) a zero order intercorrelation coefficient matrix; (2) a multiple regression analysis; and (3) a step wise multiple regression analysis. The significance of the following statistics were then determined: zero order correlation coefficients; multiple correlation coefficients; and F ratios for differences between the step wise Rs and overall Rs.

Results. The multiple correlation coefficients for the samples investigated ranged from .34 to .99. Of the nine sub groups involved in this study, significant multiple correlation coefficients between predictor and criterion variables were secured for: (1) hypothesis two, total sample of boys; (2) hypothesis four, total sample of Social Class IV; and (3) hypothesis seven, total sample of Social Class IV girls.

For the three sub groups with significant multiple Rs, the step wise multiple regression analyses isolated the following variables, rank ordered, as potent predictors of

end of third grade reading achievement:

1. Total sample of boys

   CTMM Non Language, CTMM Total, and MRT Numbers

2. Total sample of Social Class IV

   CTMM Total Data and MRT Total

3. Total sample of Social Class IV girls

   CTMM Total Data, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total Data, MRT Sentences, MRT Copying, MAT Reading.

Conclusions. The following conclusions were derived from the results for the samples investigated in this research. These conclusions were advanced with the caution that care should be taken in generalizing to Mexican-American students not similar to the sample utilized in this investigation.

1. CTMM Non Language, CTMM Total Data, and MRT Numbers could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American boys from lower socioeconomic levels (Social Class IV and V).

2. CTMM Total Data and MRT Total Data could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American students from Social Class IV.

3. CTMM Total Data, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total Data, MRT Sentences, MRT Copying, and MAT Reading could be

considered as meaningful predictors of the end of third grade reading achievement for Mexican-American girls from Social Class IV.

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CHAPTER I

INTRODUCTION

According to the NEA Tucson Survey (1966, p. v.), "the most acute educational problem in the Southwest is that which involves Mexican-American children." In analyzing the difficulties facing the Spanish-speaking children in the Southwest, it becomes evident that a large percentage of these children are faced with problems accompanying membership in a minority group, namely, poverty and bilingualism (Angel, 1951; Guerra, 1965; Manuel, 1965; Zintz, 1963). In view of these unique and complex difficulties, Guerra (1965, p. 19) stressed the importance of studying the educational problems and needs of the Mexican-American as a separate, distinct minority group.

In response to this regional educational problem, the public schools in Las Cruces, New Mexico initiated a Sustained Primary Program for Bilingual Students which was funded under Title III of the Elementary Secondary Education Act of 1965. This program began in the fall of 1967 and was originally designed for a three-year period. The sizable Mexican-American population in the Las Cruces area was highlighted in the application for this grant. Las Cruces School District Number Two reported the

population of the Las Cruces area to be 51,818 in 1967, with 19,071 classified as Mexican-American. (Las Cruces School District Number Two, 1967, p. 1.)

The educational problems of Mexican-American students within the Las Cruces schools were illustrated in that application by a survey of test data compiled from: (1) Metropolitan Readiness Test, Form R, administered in 1965, and (2) Iowa Test of Basic Skills administered during the years of 1963, 1964, and 1965. These data are included in Tables 1, 2, 3, and 4 (Las Cruces School District Number Two, 1967), and demonstrated the achievement advantage of English-speaking students enrolled in schools serving predominantly Anglo-American students. Additionally, the data revealed an increasing decline in the rate of Mexican-American students' academic achievement as they progressed through school in contrast with the rate of Anglo-American students' academic achievement.

The global purpose of the Sustained Primary Program for Bilingual Students was to "increase the achievement level of Spanish-speaking students through a sustained K-3 program, parent involvement, and a dual-language approach to teaching" (Las Cruces School District Number Two, 1967). More specifically the objectives were delimited as follows: (Las Cruces School District Number Two, 1967)

TABLE 1

Metropolitan Readiness Test Scores For 1965 of First Grade Students By Schools' Predominant Ethnic Enrollment

Schools' Predominant Ethnic Enrollment	Number of Pupils Tested	Percent of Pupils Scoring Below Percentile 25
School population predominantly Anglo-American	210	2%
School population essentially equal Mexican-American and Anglo-American	514	25%
School population predominantly Mexican-American	368	31%

TABLE 2

Reading and Total Achievement Grade Equivalent Means
For 1963 Iowa Test of Basic Skills
By Schools' Predominant
Ethnic Enrollment

Grade	Total Achievement			Total Reading Achievement		
	Anglo-American	Equal Mexican-American, Anglo-American	Mexican-American	Anglo-American	Equal Mexican-American, Anglo-American	Mexican-American
3	3.50	3.29	2.86	3.62	3.35	2.84
4	4.81	4.43	3.84	4.89	4.45	3.69
5	6.14	5.34	4.75	6.28	5.34	4.66
6	7.13	6.28	5.92	7.11	6.55	5.86

TABLE 3

Reading and Total Achievement Grade Equivalent Means
For 1964 Iowa Test of Basic Skills
By Schools' Predominant
Ethnic Enrollment

Grade	Total Achievement			Total Reading Achievement		
	Anglo-American	Equal Mexican-American, Anglo-American	Mexican-American	Anglo-American	Equal Mexican-American, Anglo-American	Mexican-American
3	3.71	3.25	2.83	3.70	3.29	2.72
4	4.80	4.28	3.64	4.94	4.36	3.59
5	6.21	5.30	4.72	6.29	5.42	4.56
6	7.39	6.21	5.29	7.46	6.21	5.25

TABLE 4

Reading and Total Achievement Grade Equivalent Means
For 1965 Iowa Test of Basic Skills
By Schools' Predominant
Ethnic Enrollment

Grade	Total Achievement			Total Reading Achievement		
	Anglo-American	Equal Mexican-American, Anglo-American	Mexican-American	Anglo-American	Equal Mexican-American, Anglo-American	Mexican-American
3	3.36	3.13	2.61	3.37	3.18	2.62
4	4.32	3.96	3.77	4.40	4.18	3.57
5	5.65	5.15	4.42	5.70	5.11	4.30
6	6.89	6.11	5.57	6.99	6.13	5.50

1. To increase the achievement level of Spanish-speaking pupils through the use of a sustained K-3 program.

2. To determine whether Spanish-speaking pupils achieve at a higher level in a program that utilizes instruction in both Spanish and English or in a program utilizing English only.

3. To involve the parents of the Spanish-speaking students in the educational program as advisors and learners thus enriching the home environment of the child.

4. To determine whether a 12 month school year (200 school days) with short vacation periods spread evenly throughout the year will serve the learner better than the 180 day regular term with its three month vacation.

The program, based on the above objectives, was initiated in August, 1967, in four schools in Las Cruces, New Mexico. These schools served areas which were predominantly inhabited by families from lower socioeconomic levels. The educational treatments for each of these groups included:

1. Group I, Experimental English, involved two first grades and one kindergarten classroom in two schools. The educational program included: instruction in English; a school year of 200 days of instruction;

evaluations of achievement, scholastic aptitude, readiness and parental involvement; a curriculum which was developed by teachers emphasizing language development, cultural pride, and an experiential approach to learning; the use of teacher aides in the classrooms; and formalized parental involvement in the educational program.

2. Group II, Experimental Spanish-English, involved two first grades and one kindergarten classroom in two schools. The treatment was the same as for Group I, except instruction was provided both in Spanish and English.

3. Group III, Control, involved the remaining first grade classrooms in the four schools which participated in the experimental program. The educational program included: instruction in English only; a school year of 180 days of instruction, however, a portion of the students attended a Second Summer Language Program at the completion of first grade for an additional 40 half days of instruction; evaluations of achievement, scholastic aptitude, readiness, and parental involvement; a traditional curriculum was employed; and traditional emphasis on parental involvement which was dependent upon individual schools and teachers.

The Problem

The aim of this study was to identify factors which contributed to reading achievement for Mexican-American students involved in the Sustained Primary Program for Bilingual Students. More specifically, the purpose of this investigation was to isolate those variables which seemed to be the most significant predictors of reading achievement for those Mexican-American students from lower socioeconomic levels who had completed the third year in the experimental project. It was the purpose of the researcher to consider selected variables which could have been measured by the classroom teacher within a regular school environment and which were hypothetically connected with reading achievement. These variables were identified as readiness, scholastic aptitude, and achievement test scores.

The relative impact of the separate educational treatments received by the subjects in the K-3 project were not explored through this research. Cordova, Pomerantz, & Stevens (1970) reported these treatment groups were representative of the same population, for after three years of instruction in the K-3 program the results revealed no significant differences between the language and reading achievement means for the three treatment groups. In view of these findings, this researcher perceived a need to identify those variables which were associated

with reading achievement for Mexican-American students from lower socioeconomic levels regardless of prior program experience.

Statement of the problem. The major educational problem examined in this study was the identification of measurable variables which were significant predictors of reading achievement for Mexican-American students from lower socioeconomic levels. The predictor variables are listed in Table 5.

Hypotheses

1. There is a significant multiple correlation between the predictor variables (MAT Word Knowledge, MAT Word Discrimination, MAT Reading, MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample.

2. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of boys.

3. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of girls.

4. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of Social Class IV.

TABLE 5

Selected Predictor Variables
For Subjects

Variables	Number of Variables
Metropolitan Achievement Test Primary Battery I Word Knowledge Word Discrimination Reading	3
Metropolitan Readiness Test Word Meaning Sentences Information Matching Numbers Copying Total Score	7
California Test of Mental Maturity Language Data Non Language Data Total Data	3
Total Number	13

5. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of Social Class V.

6. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of Social Class IV boys.

7. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of Social Class IV girls.

8. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of Social Class V boys.

9. There is a significant multiple correlation between the predictor variables and the criterion variable reading achievement for the total sample of Social Class V girls.

Need for the research. Investigations by Guerra (1965), Manuel (1965), NEA Tucson Survey (1965), and Rosen & Ortega (1969) identified educational problems of disadvantaged Mexican-American students and suggested approaches which might have helped eradicate a portion of the problems. However, at the time of this study the innovative programs being pursued with Mexican-American bilingual students

under Elementary Secondary Education Act, Titles III and VII were still in the experimental stage and their effectiveness had not been definitely established. Studies were lacking which identified the characteristics of the successful and unsuccessful Mexican-American students.

Some of the many environmental factors considered to influence reading achievement were investigated by Anastasi & Foley (1949), Goldberg (1966), Havighurst & Breese (1944), and Malmquist (1958). The results of their studies indicated children from lower socioeconomic levels encountered greater scholastic difficulties than did children from middle or upper socioeconomic levels. Few studies had been conducted which investigated the relationship of socioeconomic level to scholastic achievement for Mexican-American students. Mishra (1970) and Pomerantz (1970) examined the achievement of Mexican-American students in schools which served predominantly lower socioeconomic levels; however, no attempt was made to establish the social position of the subjects. Darcy (1963) reported that when Spanish-English speaking bilingual subjects were matched by socioeconomic level with monolingual subjects, little differences existed between the intelligence test scores of bilingual and monolingual subjects. Research reported by Darcy (1963) and Gredler (1968) suggested that socioeconomic level had a greater influence on educational performance than did ethnic group membership.

In previous investigations of school achievement, Anastasi & Foley (1949), Havighurst & Breese (1944), and Wozencraft (1963) reported sex differences existed in educational achievement. In addition, De Hirsch, Jansky, & Langford (1966) found kindergarten tests were better predictors of reading achievement for girls than for boys. The research design of the K-3 Program, reported by DeBlassie & Stevens (1969) and Cordova et al. (1970), considered sex as a variable, but did not differentiate between the socioeconomic levels of Mexican-American subjects.

The above mentioned investigations illustrated that scholastic achievement differed according to sex, socioeconomic level, and ethnic classification of the subjects. Studies were also cited which reported when subjects were matched by socioeconomic levels, many of the educational differences between ethnic groups were no longer significant. Most of the studies which investigated the educational problems of Mexican-American students, (Guerra, 1965; NEA Tucson Survey, 1965; Pomerantz, 1970; Steglish, 1969), treated Mexican-American subjects as belonging to one separate, distinct group, and did not consider the differences which existed within the social stratification of the Mexican-American population. As reported by Zintz (1963), due to the differences within the home environments, the educational achievement among Mexican-American

students from higher, middle, and lower socioeconomic levels could not be presumed to be the same. To fully understand the educational problems encountered by Mexican-American students, studies were needed which investigated the scholastic achievement of Mexican-American students within specific socioeconomic levels. Sex differences within the socioeconomic levels needed to be investigated.

Definition of Terms

Anglo-American: Caucasian American having non-Spanish surname.

Bilingual: The ability of an individual to function with an equal degree of proficiency in two languages.

K-3 Program: Sustained Primary Program for Bilingual Students being conducted in Las Cruces, New Mexico. This educational program extended from kindergarten through third grade.

Mexican-American: Caucasian American of Mexican or Spanish descent; classification based on Spanish surname and/or school information.

Reading Achievement: For the purpose of this study, reading achievement was defined as the student's performance on the subtests Word Knowledge, Word Discrimination, and Reading of the Metropolitan Achievement Test Elementary Battery designed for use in the third grade. A composite score of reading achievement was obtained for each subject by combining his standard scores on these three subtests.

Scholastic Aptitude: Scholastic aptitude was defined as the student's performance on the California Test of Mental Maturity.

Socioeconomic Level: In this investigation, socio-economic level was defined as the social position occupied by an individual within the status structure of our society. Subjects were classified according to the Two Factor Index of Social Position (Hollingshead, 1965) which utilized the two factors of occupation and education to determine social position.

Organization of the Remainder of the Investigation

A review of the literature is presented in Chapter II. The experimental design of this study with the techniques and procedures employed in gathering the data are discussed in Chapter III. The results of data gathering and analyses with a certain amount of interpretation are included in Chapter IV. A summary, the conclusions, and recommendations for further research are presented in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

This study was concerned with identifying factors which were significant predictors of reading achievement for Mexican-American students from lower socioeconomic levels. In developing the background for the investigation, special consideration was given to the literature describing the educational problems encountered by minority, bilingual, and educationally disadvantaged children.

Characteristics of Disadvantaged Students

The problems of many Mexican-American children are not unlike the problems encountered by children from disadvantaged environments. According to Passow & Elliott (1968):

> The problems of the disadvantaged stem from poverty and unemployment; segregation, discrimination and lack of opportunity in housing and employment, as well as in education; discontinuities with the "dominant" culture, rising out of differences in life style; inadequate educational attainment essential for participation in a technical society (p. 3).

The NCTE Task Force (1965), p. 75) classified the educational deficiencies which appear to accompany children from various forms of impoverished environments as being in the following three areas: (1) conceptual development, (2) language facility, and (3) self-concept. In addition

to these significant deficiencies, Brunner (1965) found disadvantaged children also seemed to possess "limited visual or auditory perception, a negative attitude toward school and learning, and little appreciation for the tools of academic learning (p. 105)."

A handicap sometimes apparent was termed by Berlin (1966, p. 24) as that of delayed maturation. He felt this probably resulted from both nutritional and stimulus deprivation. Berlin also noted two common but dissimilar behavior reactions to deprivation which became additional handicaps, the reactions demonstrated by the impulsive, aggressive child; and the passive, withdrawn child. A frequent characteristic of the disadvantaged students has been reported as their tendency to fall further and further behind their classmates as they progress through school, causing discouragement, frustration, and low self-esteem (Neisser, 1965; NCTE Task Force, 1965; Silverman, 1965). Neisser (1965, p. 4) found a significant percentage of school dropouts had experienced school failure, which indicated that failure to achieve in school was an important cause for individuals to withdraw from school.

In summary, the disadvantaged would be described as a group which possesses the characteristics mentioned by Passow & Elliott (1968, p. 9): (1) language inadequacies; (2) visual, auditory and spatial perceptual deficiencies; (3) a means of expression more motorial and concrete than

conceptual and idea-symbol focused; (4) a here and now orientation to life; (5) poor self-image; (6) nonacademic oriented life goals; (7) apathy and detachment from educational goals and processes; and (8) limited role behavior skills and inadequate or inappropriate adult models.

Educational Problems of the Mexican-American

In addition to the general effects of poverty, in many instances, the Mexican-American child must contend with the additional burden of minority group membership and bilingualism. One source of information, Steglish (1969, p. 8) reported a population of 4,000,000 Mexican-Americans in the Southwest area of the United States, which made this America's third largest as well as fastest growing minority group. This population ranged from descendants of 16th Century settlers of the United States to the most recent immigrants. Steglish (1969, p. 8) maintained that Mexican-Americans had not assimilated into the Anglo-American culture but sustained their isolation and identity keeping their own language, religion, life ways, and physical visibility. Their average family size was large, by Anglo standards, and this combined with inadequate housing tended to create an environment not conducive to the privacy and concentration upon which successful school work depends.

Rosen & Ortega (1969, p. 6) stated that Spanish-speaking Mexican-Americans and immigrants constituted the

second largest linguistic group in the United States. Many children of Spanish-speaking parents did not begin school in the United States with linguistic, experiential, psycho-cultural or socioeconomic equivalence of their English-speaking contemporaries. The linguistic disabilities of underprivileged and minority groups represented one of the most fundamental handicaps in our schools.

The problems which faced the Mexican-American child as he entered school were much more complex than the transition to the school situation experienced by Anglo-American children. When a child from a minority group who spoke a language other than English entered school, he not only attempted to adjust to a different culture which contained a new set of standards, but also to a new language, therefore, he was immediately unable to verbally express himself (Zintz, 1963).

As Manuel (1965) related, Spanish was the mother tongue of these children. It was the language with which the child functioned within his home environment. When he first entered school, he was expected to immediately switch to English. English became his second language, yet he was required to perform his school tasks in that language while it was still insufficiently developed. This created discouragement, frustration, and encouraged isolation. When an impoverished home situation was added, his handicap increased.

Most of these Mexican-American children knew neither Spanish nor English well. According to Manuel (1965, p. 117), the Spanish spoken in their homes was a poor grade of Spanish. They lacked the experiences and stimuli which helped develop the concepts common to other children. They received no instruction in Spanish, which would have been necessary to develop ability in that language, and had insufficient contact with English to become proficient. Cordova (1969) stated:

> The language barrier, the experience barrier, and the cultural barrier are formidable problems in the education of Spanish-American students . . . . Spanish-American children tend to start school at much the same level as children from the dominant society in terms of both I.Q. and achievement. However, the longer they remain in school the less they resemble the other children in their endeavors (p. 3).

The NEA Tucson Survey (1966, p. 5) reported approximately 1.75 million elementary and high school students having Spanish surnames within the five Southwestern states of Arizona, California, Colorado, New Mexico, and Texas. Within these states, poverty was found to be more prevalent among the Mexican-American population than the Anglo population; Table 6 reflects this situation (NEA Tucson Survey, 1966, p. 6).

A large proportion of the Mexican immigrants to the United States were from the lower economic level, being unskilled and semiskilled laborers who came to the United States in hopes of improving their economic situation.

TABLE 6

Income for General Population Versus White Spanish Surname Population for the Southwestern States

	Families with Incomes under $1000		Families with Incomes under $3000		Families with Incomes of $10,000 or more	
	General Population	White Spanish Population	General Population	White Spanish Population	General Population	White Spanish Population
Arizona	5.9%	7.2%	21.3%	30.8%	14.4%	4.6%
California	3.3	4.5	14.1	19.1	21.8	10.8
Colorado	3.5	6.4	18.3	35.0	14.6	4.8
New Mexico	6.9	11.3	24.4	41.5	14.3	4.5
Texas	7.6	13.6	32.5	51.6	11.8	2.7
Southwest	4.9	8.8	21.0	34.8	17.6	6.6

As so often occurs, "the first-generation immigrants tended to bequeath their poverty to the generations that came after them" (NEA Tucson Survey, 1966, p. 5).

Manuel (1965, p. 15) stated that large differences in financial levels tend to create not only barriers between the different economic levels but also to develop among the lower economic levels feelings of inferiority. For the bilingual individual who is also from an impoverished environment and experiences little success in school, the difficulties are multiplied. Poverty has been found to have a direct bearing upon school success and the amount of education the children are likely to receive (Manuel, 1965; NEA Tucson Survey, 1966).

Guerra (1965, p. 19) contended that the conflicts of two cultures, Anglo as represented by the school, and Spanish as represented in the home, caused a division of loyalty within the child. He wanted to be accepted yet could not wholly become a part of either culture. This caused low self-esteem and insecurity and the child became embarrassed by his differences. This view was further reflected by Bruce Gaarder, Specialist in Foreign Languages with the United States Office of Education (NEA Tucson Survey, 1966):

> The greatest barrier to the Mexican-American child's scholastic achievement . . . is that the schools, reflecting the dominant view of the dominant culture, want that child to grow up as another Anglo. This he cannot do except by denying

> himself and his family and his forebears, a form of masochism which no society should demand of its children (p. 8).

Ainsworth & Butefish (1969) offered Demo's enumeration of the educational problems facing Mexican-American students:

> (1) low level of aspiration, resulting in failure to achieve commensurate with ability;
> (2) lack of parental aspiration and support of educational effort;
> (3) excessive early school dropouts;
> (4) bilingualism and inadequate facility in the use of the English language;
> (5) biculturalism or dualism in cultural values between the Spanish-speaking and dominant group;
> (6) excessive peer identification and formation of gangs;
> (7) economic insecurity; the need to contribute to family support;
> (8) attitudinal differences contrary to the Anglo-American feeling toward education (p. 2).

The foregoing authorities presented information which substantiated the handicaps faced by many Mexican-American students. The remainder of this chapter will review research related to those predictor variables under consideration in this study, namely: (a) readiness as a predictor of reading achievement; (b) scholastic aptitude as a predictor of reading achievement; and (c) sex as a variable in academic achievement.

Relation of Readiness to Reading Achievement Studies Reporting Significant Correlations

Bagford (1968) compiled the testing results obtained for students enrolled in Iowa City Public Schools to study the effectiveness of reading readiness scores in predicting

success in reading. The testing program included administration of Metropolitan Readiness Test in kindergarten, Harrison-Stroud Reading Readiness Profiles in first grade, Iowa Test of Basic Skills in the fourth, fifth and sixth grades, and Lorge-Thorndike Intelligence Test in the sixth grade. All the subtests on both the Metropolitan Readiness Test and Harrison-Stroud Reading Readiness Profiles were found to correlate significantly, at either the .01 or .05 level, with the Vocabulary and Comprehension subtests of the Iowa Test of Basic Skills at the fourth, fifth, and sixth grade levels. He concluded that reading readiness test scores are significantly related to both early and later success in reading.

In attempting to predict second grade reading performance from measures of reading readiness, De Hirsch et al. (1966) studied kindergarten students from low socioeconomic levels. The following tests were found to be significantly related to overall reading performance at completion of second grade: Behavioral Control, Pencil Use, Human-Figure Drawing, Bender Visuo-Motor Gestalt Test, Tappedout Patterns, Wepman Auditory Discrimination Test, Story Organization, Number of Words Used, Categories, Name Writing, Letter Naming, Horst Reversals Test, Word Reproduction, Ego Strength, and Work Attitude. Letter Naming was found to be the best reading predictor.

The relationship of scores on the Metropolitan Readiness Test of beginning first grade students to scores obtained on the Stanford Achievement Test at completion of grades three and four, was investigated by Kingston (1962). The scores obtained on the Metropolitan Readiness Test subtests Matching and Numbers were found to be significantly related to scores obtained on the Stanford Achievement Test subtests Paragraph Meaning, Word Meaning, Average Reading, and Battery Medium.

The prediction of end of first grade reading achievement for students enrolled in the kindergarten and first grade Campus School of the State University College at Buffalo, New York, was attempted by Panther (1967). The testing program included Lee-Clark Reading Readiness Test, Lorge-Thorndike Intelligence Tests, Peabody Picture Vocabulary Test, Goodenough-Harris Drawing Test, and Rutger Drawing Test. All of these measures except Rutger Drawing Test, were found to correlate significantly at the .01 or .05 level with the Metropolitan Achievement Test subtest Reading.

The Kindergarten Evaluation of Learning Potential is both an educational and evaluation program conducted throughout the school year. Wilson & Robeck (1963) reported a correlation coefficient of .60 between scores on the KELP and end of first grade performance on the reading portion of the Metropolitan Achievement Test.

Readiness measures reported as poor predictors. The value of using Lee-Clark Reading Readiness Test to predict reading achievement in grades one, two, three, and four was investigated by Dobson & Hopkins (1963). Reading achievement was measured by Wide Range Reading Test administered each year, Teacher Ranking obtained each year, California Reading Vocabulary and California Reading Comprehension administered in grades three and four. The validity coefficients obtained in their study ranged from moderate to low, and decreased with each successive grade, indicating the Lee-Clark Reading Readiness Test to be a poor long range predictor of reading achievement.

Karlin (1957) utilized results obtained from beginning first grade students on the Metropolitan Readiness Test to predict reading achievement as measured by Gates Primary Reading Test, Paragraph Reading, administered at the end of first grade. He found a very small relation between Metropolitan Readiness Test scores and reading achievement, and concluded that readiness test scores fail to predict reading success.

Scholastic aptitude and readiness tests as predictors. A comparison of the effectiveness of readiness tests and intelligence tests as predictors of reading achievement was conducted by Dean (1939). Beginning first graders in Billings, Montana were administered Monroe's Reading Aptitude Tests for Prediction and Analysis of Reading

Abilities and Disabilities, Metropolitan Readiness Test, and Stanford Revision of Binet-Simon Intelligence Scale. After six months instruction, the Metropolitan Achievement Test was administered as a measure of reading achievement. The correlation coefficients reported were: Stanford-Binet with Metropolitan Achievement Test, .62; Metropolitan Readiness Test with Metropolitan Achievement Test, .59; Monroe's Reading Aptitude Tests with Metropolitan Achievement Test, .41. Dean concluded that mental age seems superior to scores on reading readiness tests in predicting reading achievement.

Hopkins & Sitkei (1969) compared the effectiveness of Lee-Clark Reading Readiness Test and California Test of Mental Maturity to predict reading performance at completion of grade one. Teacher ratings were used as the reading achievement criteria. The readiness test scores proved to be as good a predictor as the intelligence test scores.

Social class related to readiness. Using the Illinois Test of Psycholinguistic Abilities, Deutsch (1968) found that lower-class children had more difficulty with subtests involving auditory input channels than with those presenting information visually. The subtest Digit Span was an exception to this finding. She theorized that the social and cultural environment in which an individual lives influences not only what he learns but how he learns.

Malmquist (1958) noted a significant relationship between reading ability and social class among the sample he investigated in Sweden. In examining the separate variables used in social status classification, a significant relationship was found to exist between reading ability and (1) parent income, (2) social group, (3) number of books in the home, (4) number of rooms in the home, and (5) the child having his own room.

Robinson (1966) studied the reliability of evaluation instruments for the socioeconomic groupings of average, disadvantaged, and advantaged kindergarten students. The Metropolitan Readiness Test was among the measures utilized and its reliability was established through a test-retest procedure. Robinson reported that the Metropolitan Readiness Test was found to be reliable for disadvantaged and average students, but not as reliable for advantaged students.

Social class and ethnic origin related to readiness. An analysis of the performance on a perceptual test by students from disadvantaged environments was conducted by Gredler (1968). His subjects were third and fourth grade students from one Negro and one Caucasian disadvantaged school. The Draw-A-Man, Metropolitan Achievement Test reading battery, and the Minnesota Percepto-Diagnostic Test were administered. On the Metropolitan Achievement Test, both groups scored below the norm, but

there was no significant difference between the sample groups of Negro and Caucasian. On the Minnesota Percepto-Diagnostic Test, both groups showed higher rotation scores than did its standardization sample, and the Negro group showed significantly higher rotation than the Caucasian group. The authors of the Minnesota Percepto-Diagnostic Test contend that rotated figures are indicative of pathology. The results from this investigation suggested that the environment influences both school achievement and the manner in which an individual reacts to specific tasks.

Mishra (1970) investigated the relationship between the scores obtained on Metropolitan Readiness Test administered in first grade and Metropolitan Achievement Test subtest Word Knowledge and Reading administered at completion of third grade. The subjects were 40 male and 33 female Mexican-American children living in a poverty area in Tucson, Arizona. The correlation coefficients obtained were lower than those reported in the test manual and ranged from .09 to .53. The MRT subtests Total, Numbers, and Alphabet had the highest correlations with the MAT. The results suggested that with Mexican-American children from poverty areas, subtests on the Metropolitan Readiness Tests which are verbal have lower reliability and predictive value than those not requiring as much ability in English.

Predictability of readiness tests for various ethnic groups. Two studies conducted by Mitchell (1967) compared the predictive validity of readiness tests for various ethnic groups. The first study utilized results obtained from the Metropolitan Readiness Test and the Murphy-Durrell Reading Readiness Analysis administered to beginning first grade students, to predict end of first grade performance on the Stanford Achievement Test subtests pertaining to reading and spelling. The ethnic grouping of these subjects were: White, 7,310; Negro, 518; Mexican, 139; Oriental, 37; ethnic origin unknown, 1,473. The ranges of the reliability coefficients for the White group were .54 to .59; for the Negro group, .52 to .60; for the Mexican group, .56 to .64; and for the Total group, .57 to .64. His second study examined the relationship of the Metropolitan Readiness Test to end of first grade reading test scores on the Metropolitan Achievement Test for Negro and White children within a county in the State of Virginia. The reliability coefficients ranged from .51 to .56 for the White children, and from .47 to .55 for the Negro children. His conclusion from these two studies was that the predictive validity for the two readiness tests was similar for all groups studied.

Summary. The research suggested that measures of reading readiness were related to reading achievement. Exceptions to this were reported by Dobson & Hopkins (1963)

and Karlin (1957). The predictive validity of readiness tests appeared to be similar for the ethnic groupings of White, Negro, Mexican-American, Oriental, and ethnic origin unknown. Using test-retest procedure to establish reliability, readiness test scores were found to be more reliable for the socioeconomic groupings of average and disadvantaged kindergarten students than for advantaged kindergarten students. Children from educationally depressed environments tended to encounter difficulties in reading achievement and tasks involving verbal abilities, and visual and auditory perception.

Relation of Scholastic Aptitude to School Achievement

Cooper (1950) was concerned with predicting school achievement for bilingual fifth grade pupils from relatively isolated villages in Guam. The dominant language spoken in these villages was Chamorros, with English being spoken only at school. Six measures of intelligence were utilized, one of which was the California Test of Mental Maturity Form S Elementary. According to his findings, all intelligence tests utilized correlated positively with the California Achievement Test. He was able to conclude that intelligence tests examined did predict school success, and the Non Language I.Q. score obtained from the California Test of Mental Maturity was as effective a predictor as the Total I.Q. score.

Dizney & Fleming (1964) used sixty-four fourth grade

classrooms within the State of Ohio to study the use of intelligence test scores for predicting school achievement. The measuring instruments utilized were California Test of Mental Maturity and California Achievement Battery, Elementary Four. The subtests Reading Vocabulary and Reading Comprehension of the California Achievement Test were found to be significantly related to scores on the California Test of Mental Maturity for both sexes.

A study by Hopkins & Sitkei (1969) compared the use of intelligence tests and readiness tests as predictors of grade one reading performance as rated by teachers. The Lee-Clark Reading Readiness Test proved as effective a predictor as the California Test of Mental Maturity.

Using subjects from lower socioeconomic environments, De Hirsch et al., (1966) found ability test scores were significantly related to reading achievement; however, eleven other tests proved to be better predictors of reading achievement.

An intercorrelation study among various intelligence and achievement tests was conducted at the fourth grade level by Knieff (1959). Among the tests intercorrelated were: Lorge-Thorndike Intelligence Tests, Verbal; Lorge-Thorndike Intelligence Tests, Nonverbal; Davis Ellis Games; Ravens Progressive Matrices; Iowa Tests of Basic Skills. The Lorge-Thorndike Verbal Test was found to be the best

predictor of achievement on the Iowa Test of Basic Skills, followed by Lorge-Thorndike Nonverbal. Correlation coefficients reported for Lorge-Thorndike Verbal and the Iowa Test of Basic Skills reading and language subtests ranged from .73 to .79; for the Nonverbal Lorge-Thorndike, the r's ranged from .58 to .61.

Factors related to reading disabilities of first grade students in Sweden were investigated by Malmquist (1958). He reported significant differences between the mean ratings of intelligence for all samples of good and poor readers, indicating poor reading was associated with low intelligence. There was a tendency for children belonging to higher social groups to have higher I.Q. scores than children belonging to lower social groups.

Panther (1967) utilized a series of tests to predict first grade reading achievement on the Metropolitan Achievement Test. Ingelligence test results obtained from Lorge-Thorndike Intelligence Tests and Peabody Picture Vocabulary Test were found to be significantly related to performance on the Metropolitan Achievement Test.

Using Spanish-speaking bilingual students enrolled in the K-3 Program, Pomerantz (1970) compared the effectiveness of three administrations of the California Test of Mental Maturity in predicting end of third grade reading achievement. Reading achievement was measured by the Metropolitan Achievement Test subtests Word Knowledge,

Word Discrimination, and Reading. The California Test of Mental Maturity was administered at the beginning of first grade, end of first grade, and completion of third grade. The CTMM was found to be a valid instrument for predicting reading achievement with no one administration being the best predictor.

The measure obtained from the Kindergarten Evaluation of Learning Potential was reported by Wilson (1963) to have a correlation coefficient ranging from .60 to .73 with the Stanford Binet Intelligence Scale.

Comparisons between social class and scholastic achievement. In summarizing the literature which investigated the relationship of social class and intelligence, Anastasi & Foley (1949, p. 800) stated, "In general, there seems to be a difference of about 20 points between the mean I.Q.'s of the children of professional people and day laborers." They cite a study by Goodenough which demonstrated that these differences, as revealed by the Kuhlmann-Binet, were just as apparent at ages 2 to 5½ years as at ages 15 to 18 years. Anastasi & Foley conclude that social differences vary with the function tested and the indications are that correlations of intelligence with social status are higher in those abilities which might be favored by a superior social environment.

According to Goldberg (1966), in studies which

compared ability and achievement test scores of lower and middle class pupils, usually students from higher income families score higher on all cognitive measures, even when the instruments are considered to be "culturally fair".

A comparison of intelligence test scores of educationally disadvantaged Negro and Caucasian third and fourth grade students was conducted by Gredler (1968). His measure of intelligence was obtained from Draw-A-Man Test. The results indicated no significant difference existed between the groups. Using the Metropolitan Achievement Test to measure reading achievement, both groups scored below the norm, but there was no significant difference between the ethnic groupings.

A study conducted in a midwestern community by Havighurst & Breese (1944) investigated the relationship of social status to ability. The subjects were students in grades four through nine. Results showed the higher the social status the better the scores on Thurston Tests of Primary Abilities. It appeared that the relationship was more positive on Number, Verbal and Word Fluency abilities than on Space and Memory abilities.

Investigations involving bilingual subjects. Carlson (1950) utilized the California Test of Mental Maturity Form S Elementary, to obtain measures of intelligence for American children of Mexican parentage. The subjects were fifth and sixth grade students in one

Los Angeles school. He found the Mexican-American students had lower intelligence scores than the Anglo students. The mean non-language score was not significantly different from the mean language score for either group.

In Darcy's (1963) review of studies investigating ability test results of Spanish-English bilinguals in the Southwest, the literature revealed a tendency for bilingual subjects to receive significantly lower scores on verbal tests of intelligence than on non-verbal tests of intelligence. Bilinguals received significantly lower scores than monolingual subjects on both the verbal subtests of individual intelligence scales, and on individual intelligence tests of the performance type. When subjects were not matched by socioeconomic levels, monolinguals received significantly higher scores on verbal tests of intelligence and non-verbal tests of intelligence, but when subjects were matched by socioeconomic levels, the mean scores on a non-verbal intelligence test did not differ significantly between the monolingual and bilingual groups.

Pomerantz (1970) investigated the effectiveness of intelligence test scores in predicting reading achievement for Mexican-American students. He found the California Test of Mental Maturity to be a valid instrument for predicting reading achievement for the Mexican-American subjects in his study.

Summary. According to the literature reviewed, scores obtained on ability tests were related to reading achievement and a verbal measure of intelligence appeared to be the best predictor of reading achievement. For bilingual individuals, the non-verbal or non-language portion of intelligence tests were usually a more valid measure of ability than the verbal or language scores. An exception to this was reported by Carlson (1950) who found no significant difference between language and non-language scores for either bilingual or monolingual groups of students. Indications were that correlations of intelligence with social status were higher in those abilities which might be favored by a superior social environment. There tended to be little difference between ethnic groups when social position was considered as a variable.

Sex Differences in School Achievement

Many studies have found educational differences existed between the sexes. Anastasi & Foley (1949) provided a summary of research regarding sex differences in intelligence and school achievement test scores. They reported on verbal type intelligence tests, sex differences were slight, but more often favored girls. Girls consistently scored higher on the National Intelligence Tests. A study by Goodenough attempted to eliminate the effects of schooling by comparing scores obtained by pre-school children on the Kuhlmann-Binet. However, girls were still

found to score higher than boys. Studies involving the Stanford Binet showed no significant difference between sexes. Anastasi & Foley conclude that significant sex differences on intelligence test scores were dependent upon the items included, and females have demonstrated to be superior in verbal or linguistic functioning. Girls surpassed boys in those school subjects depending on verbal ability, memory, and perceptual speed; boys exceeded girls in those subjects requiring numerical reasoning, spatial aptitudes and information subjects such as history, geography, and general science. Girls consistently obtained higher achievement test scores than boys.

In evaluating the first year of the K-3 Program, DeBlassie & Stevens (1969) reported Mexican-American boys displayed more language growth during the first grade instructional period than did females. Cordova et al., (1970) found during the second year of this program that the girls displayed more language growth than did the boys. Pomerantz (1970) observed few significant differences among correlation coefficients for boys and for girls in the K-3 Program on the correlated tests, California Test of Mental Maturity and Metropolitan Achievement Test, and concluded the CTMM to be as effective a predictor of reading achievement for either sex.

De Hirsch et al., (1966) found most kindergarten tests utilized in their study were better predictors of

first grade achievement in reading for girls than for boys.

Dizney & Fleming (1964) used sex groupings to analyze the use of intelligence scores to predict school achievement and reported differences did exist between the correlation coefficient for these two groups.

Havighurst & Breese (1944) reported girls in grades four through nine obtained higher test results on Thurstone Tests of Primary Mental Abilities than did boys, however, boys excelled girls on the Space test. The differences were not significant on the Verbal test.

In studying first grade students in Sweden, Malmquist (1958) found girls obtained better average results on reading tests than did boys, but boys had higher average intelligence scores than the girls.

A study by Stroud & Lindquist (1942) examined sex differences in school achievement as measured by Iowa Every-Pupil Basic Skills Testing Program. Girls were reported to have higher test scores in all subjects except arithmetic.

Wozencraft (1963) utilized students from third and sixth grades in Cleveland, Ohio to compare sex and school achievement. In the mean comparison on the Stanford Achievement Test, girls scored significantly higher on the subtests Paragraph Meaning, Word Meaning, Reading Average, Arithmetic Reasoning, Arithmetic Computation,

and Arithmetic Average. No differences were found to exist between boys and girls in mental age.

Research indicated sex differences existed in educational achievement. Girls appeared to be higher achievers in areas relying on verbal ability, whereas boys surpassed girls in those subjects requiring numerical reasoning. However, Stroud & Lindquist (1941) and Wozencraft (1963) found girls also had higher achievement test scores in subtests requiring numerical reasoning. Significant sex differences on intelligence test scores seemed to be dependent on items included. The inconsistent language growth reported by the K-3 Program, made it inadvisable to draw any conclusions regarding sex language differences for Mexican-American students at this time. However, the CTMM was found to be as effective a predictor of reading achievement for either sex of Mexican-American students participating in the K-3 Program.

Summary

A review of the literature revealed that children from disadvantaged environments lacked many of the basic skills, experiences, attitudes, values, and parental encouragement conductive to successful academic achievement. In addition to these problems, many Mexican-American children entered school having little exposure to the English language and were placed in situations in which English was the language they were expected to use. For these

children, the language barrier often became a very real handicap. Measures of readiness and scholastic aptitude have been found to be related to reading achievement, however, bilingualism, social class position, and sex may have effected the manner in which an individual performed in an academic situation.

CHAPTER III

METHOD OF INVESTIGATION

The purpose of this study was to identify those variables which seemed to be the most meaningful predictors of third grade reading achievement for Mexican-American students from lower socioeconomic levels. This chapter discusses the: (1) setting and sample; (2) evaluation instruments utilized; (3) procedure; and (4) treatment of data.

Setting and Sample

Las Cruces is located in the Rio Grande Valley in the southern portion of the State of New Mexico. It is an agricultural area as well as a university and scientific community, with New Mexico State University and White Sands Missile Range employing a large portion of the population. Las Cruces School District Number Two is composed of eighteen elementary, five junior high and two senior high schools. There are also two Catholic parochial elementary schools located in Las Cruces.

The subjects utilized in this study were drawn from the four elementary schools which participated in the Sustained Primary Program for Bilingual Students in Las Cruces, New Mexico, and served areas predominantly

inhabited by families from lower socioeconomic levels. Criteria for selection of subjects were: (1) subjects were of Mexican-American descent; (2) subjects entered first grade in August 1967, and were born during the year 1961; (3) the sample was comprised of those students for whom ability, readiness, and achievement test data were available, as well as information regarding the occupational and educational level of the head of each household; and (4) subjects were classified as belonging to Social Class IV or V of Hollingshead's (1965) Two Factor Index of Social Position. Table 7 presents a description of subjects by school, social position, and sex.

The social class position of subjects was determined using Hollingshead's (1965) Two Factor Index of Social Position. This index appears in Appendix A. The range of possible scores is from 11 to 77, with 11 representing the highest possible social position and 77 the lowest social position. For the purpose of this investigation, the continuum of scores was divided into a hierarchy of social class groups shown in Appendix B (Hollingshead, 1965). Due to an inadequate representation of Social Classes I, II, and III, only Social Class Groups IV and V were involved in this study. According to Bergel (1962), Social Class Groups IV and V would be considered representative of the upper-lower and lower-lower social class groups. Table 8 provides the Two Factor Index of Social

TABLE 7

Sample By School, Social Position, And Sex

Elementary School	Social Class IV (Upper-Lower)		Social Class V (Lower-Lower)	
	Male	Female	Male	Female
Bradley	8	6	9	6
Lucero	5	5	5	5
Mesilla	5	3	6	12
Washington	3	2	6	8
Total	21	16	26	31
N = 94	Social Class IV N = 37		Social Class V N = 57	

TABLE 8

Distribution of Scores Obtained By Sample Using The Two Factor Index of Social Position

Social Class IV (Scores 44-60)		Social Class V (Scores 61-77)	
Score	Frequency	Score	Frequency
59	8	77	26
58	5	73	7
56	1	70	4
55	6	69	3
52	1	66	6
51	5	65	2
48	3	63	4
47	1	62	5
44	7		
Totals	37		57

Position scores obtained by the subjects in the sample.

Description of Evaluation Instruments

California Short-Form Test of Mental Ability: Primary 1957 S-Form. The California Short-Form Test of Mental Ability is a group ability test intended for use by a classroom teacher. The four mental factors it attempts to measure are: Spatial Relationships; Logical Reasoning; Numerical Reasoning; and Verbal Concepts. The scores provided are Language Score, Non-Language Score, and Total Score; each of which are expressed in terms of mental age and intelligence-quotients. The Primary Forms are composed of the following subtests: (1) Sensing right and left; (2) Manipulation of areas; (3) Similarities; (4) Inference; (5) Number concepts; (6) Numerical quantity; and (7) Verbal concepts (Sullivan, 1957). According to correspondence received from California Test Bureau, no correlation coefficients have been computed between the 1957 Primary and any later published forms of this test.

Metropolitan Achievement Tests: Primary I and Elementary Batteries. The Metropolitan Achievement Tests were designed to measure a pupil's progress throughout his school experience. The authors attempted to build the test around the school curriculum. The Primary I Battery is primarily for use in the latter half of grade one and the Elementary Battery for use in grades three and four; they are both meant to measure the pupil's achievement

in reading and arithmetic. Primary Battery I consists of the following five subtests: (1) Word Knowledge; (2) Word Discrimination; (3) Reading; and (4) Arithmetic Concepts and Skills. The Elementary Battery consists of the following eight subtests: (1) Word Knowledge; (2) Word Discrimination; (3) Reading; (4) Spelling; (5) Arithmetic Problem Solving and Concepts; (6) Arithmetic Computation; (7) Language Usage; and (8) Punctuation and Capitalization (Durost, et al., 1962).

Metropolitan Readiness Tests Form R. The Metropolitan Readiness Tests were devised to measure the traits and achievement of school beginners which contribute to their readiness for first grade instruction. They were designed to test students at the completion of the kindergarten year or the beginning of first grade. The following six subtests comprise the test: (1) Word Meaning; (2) Sentences; (3) Information; (4) Matching; (5) Numbers; and (6) Copying (Hildreth, et al., 1949). Information obtained in a telephone conversation with Mrs. Margaret Richardson, Testing Division, Harcourt, Brace & World, New York, indicated that no correlation coefficients have been computed between the MRT Form R and any later readiness tests. However, the results obtained on the revisions are considered by the publisher to be very similar to those obtained on Form R.

Procedure

The data were collected from the evaluation instruments employed by the Sustained Primary Program for Bilingual Students, and included:

1. Metropolitan Achievement Test Elementary Battery administered at the completion of grade three, May 1970.

2. Metropolitan Achievement Test Primary Battery I administered at completion of grade one, May 1968.

3. Metropolitan Readiness Test administered during the first month of grade one, September 1967.

4. California Test of Mental Maturity administered at completion of grade one, May 1968. To insure that those students who did not comprehend English understood the directions, the instructions for this test were given orally in both English and Spanish. For consistency of administration, the same test administrators were used for all subjects.

5. Information regarding the occupational and educational level of the head of each household was obtained. A parent information questionnaire was mailed to each parent and the response was on a voluntary basis.

6. Sex of pupil.

The criterion variable concerned in this study was reading achievement derived from a composite of the standard scores obtained on the reading subtests (Word Discrimination; Word Knowledge; and Reading) of the MAT

Elementary Battery administered at the completion of grade three.

Treatment of the Data

Multiple regression analyses were performed to determine if measures of first grade readiness, scholastic aptitude, and reading achievement were significant predictors of end of third grade reading achievement. This analysis was conducted for each of the following groups: (1) the total sample group; (2) the total sample of boys; (3) the total sample of girls; (4) the total sample of Social Class IV; (5) the total sample of Social Class V; (6) the total sample of Social Class IV boys; (7) the total sample of Social Class IV girls; (8) the total sample of Social Class V boys; and (9) the total sample of Social Class V girls. To isolate the variables which were the most potent predictors of third grade reading achievement, a step wise multiple regression analysis was performed for each of the above groupings. A computer program for a step wise multiple regression analysis designed by Muller (1969) was employed and is presented in Appendix C. Muller (1969) describes this method as follows:

> This program is designed to perform a multiple regression analysis (MRA). Following this, the variables are selected according to their predictive powers and successive MRAs are performed. The first of these analyses includes only the most potent variable; the second the two most potent variables; and so on until all the variables are again included in the MRA. This procedure results in a step wise multiple regression analysis (SWMRA).

All multiple Rs were tested for significance at the .05 level. F ratio testing of the difference between the MRA and each SWMRA was conducted.

Summary

The sample involved in this study consisted of ninety-four lower Social Class Mexican-American third grade students. Hollingshead's (1965) Two Factor Index of Social Position was utilized to identify Social Class of subjects. Descriptions of the California Test of Mental Maturity, Metropolitan Readiness Test, and Metropolitan Achievement Tests are included in this chapter. The evaluation procedure consisted of measures of first grade scholastic aptitude, readiness, and achievement, and measures of third grade reading achievement. Multiple regression analyses were performed to determine if measures of first grade readiness, scholastic aptitude, and reading achievement were significant predictors of end of third grade reading achievement. This analysis was conducted for each of the following groups: (1) the total sample group; (2) the total sample of boys; (3) the total sample of girls; (4) the total sample of Social Class IV; (5) the total sample of Social Class V; (6) the total sample of Social Class IV boys; (7) the total sample of Social Class IV girls; (8) the total sample of Social Class V boys; and (9) the total sample of Social Class V girls. To isolate the variables which were the most potent predictors of

third grade reading achievement, a step wise multiple regression analysis was performed for each of the above groupings.

Chapter IV will report the results of the analyses of these data.

CHAPTER IV

Results of The Study

The statistical results of this study are presented and analyzed in this chapter. For each of the sub groups studied, the following are reported: (1) the intercorrelations between all the variables; (2) the multiple regression analysis (MRA); and (3) the step wise multiple regression analysis (SWMRA). Data included in the intercorrelation matrices do not bear directly on the hypotheses of this study but are basic in deriving the multiple R. The multiple regression analyses provided the multiple Rs which permitted evaluation of the hypotheses under consideration in this study, and also provided the additional statistical information necessary for prediction of the criterion variable. Finally, the step wise multiple regression analyses selected the independent variables according to their predictive powers and successive multiple regression analyses were performed. F ratio testing of the difference between the MRA and each SWMRA was conducted.

The objective of this investigation necessitated the collection of scores on the California Test of Mental Maturity (CTMM), Metropolitan Readiness Test (MRT), and Metropolitan Achievement Test Primary and Elementary Batteries (MAT) for all subjects in the study. Three scores

obtained from the CTMM, seven scores from the MRT, and three scores from the MAT Primary were utilized as the thirteen predictor variables. A composite reading achievement score was obtained by combining the standard scores an individual received on the MAT Elementary subtests of Word Knowledge, Word Discrimination, and Reading. This combination of scores was utilized as the criterion variable. A socioeconomic classification of subjects was secured utilizing the Two Factor Index of Social Position (Hollingshead, 1965).

Testing of the Hypotheses

Hypothesis one. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample.

The zero order intercorrelation coefficient matrix is presented in Table 9. An examination of these data revealed that all the individual correlations between the predictor variables were positive and significant, whereas, none of the correlations between the predictor variables and the criterion variable were significant. These results suggested that for the total sample, the predictor variables had little relationship to the criterion variable.

TABLE 9

Zero Order Intercorrelation Matrix of Variables
For Total Sample (N = 94)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.03	-.10	-.03	.02	.12	.04	.03	.11	.15	.10	-.05	.08	.03
MRT													
1 Word Meaning		.63**	.69**	.39**	.48**	.42**	.81**	.42**	.42**	.36**	.37**	.35**	.41**
2 Sentences			.71**	.34**	.45**	.29**	.72**	.35**	.35**	.22*	.25*	.31*	.33**
3 Information				.47**	.54**	.38**	.81**	.44**	.40**	.35**	.33**	.40**	.44**
4 Matching					.58**	.54**	.70**	.43**	.42**	.47**	.24*	.50**	.47**
5 Numbers						.46**	.75**	.53**	.45**	.38**	.24*	.41**	.40**
6 Copying							.66**	.52**	.46**	.34**	.24*	.40**	.39**
7 Total								.61**	.56**	.48**	.41**	.53**	.56**
MAT													
8 Word Knowledge									.83**	.62**	.27**	.46**	.45**
9 Word Discrimination										.59**	.30**	.52**	.50**
10 Reading											.26*	.35**	.37**

TABLE 9 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.03	-.10	-.03	.02	.12	.04	.03	.11	.15	.10	-.05	.08	.03
CTMM													
11 Language												.44**	.80**
12 Non Language													.89**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

The results obtained in the multiple regression analysis appear in Table 10. The non-significant multiple correlation coefficient was .34 ($F = .078$; $df = 13, 80$; $P < .05$) and did not support the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 11. An inspection of these data indicated that the step wise R utilizing the most potent predictor variable, CTMM Total Data, was not significantly different from the overall multiple R which included all the variables. Therefore, the independent variables proved not to be potent predictors of the criterion.

Hypothesis two. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of boys.

The statistical analysis utilized in this research produced an approximation of the optimum step wise multiple regression solution and in one analysis, concerning hypothesis two, an adjustment was necessary (Berglund, 1965). This adjustment entailed the elimination of the predictor variable CTMM Language.

The zero order intercorrelation coefficient matrix is presented in Table 12. The individual coefficients

TABLE 10

Multiple Regression Analysis
For The Total Sample
(N = 94)

Variable	Mean	SD	Predictor Variables: Partial Regression Coefficient	Predictor Variables: Standard Partial Regression Coefficient	Predictor Variables: S.E. of Regression Coefficient
MRT					
1 Word Meaning	13.12	3.83	-2.33	-0.24	2.23
2 Sentences	8.83	2.77	-4.34	-0.34	2.50
3 Information	10.37	3.01	-1.78	-0.14	2.52
4 Matching	13.64	4.25	-2.49	-0.28	1.63
5 Numbers	11.68	4.80	0.35	0.04	1.43
6 Copying	6.32	3.02	-1.91	-0.15	2.12
7 Total	63.80	17.16	1.72	0.80	1.19
MAT					
8 Word Knowledge	19.78	7.88	-0.80	-0.17	1.03
9 Word Discrimination	21.09	7.63	1.28	0.26	0.99
10 Reading	18.46	8.80	0.27	0.06	0.62

TABLE 10 (Continued)

Predictor Variables

Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	29.15	4.05	-7.06	-0.77	8.42
12 Non Language	27.79	5.28	-5.46	-0.78	8.48
13 Total Data	28.70	3.93	11.84	1.25	16.99

Criterion Variable

Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	135.88	37.13	0.34	37. 70	156.98

TABLE 11

Step Wise Multiple Regression Analysis
For the Total Sample (N = 94)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	R stepwise	F*	df	P
13	0.03	0.84	12, 80	<.05
13, 7	0.04	0.91	11, 80	<.05
13, 7, 12	0.11	0.89	10, 80	<.05
13, 7, 12, 11	0.15	0.71	9, 80	<.05
13, 7, 12, 11, 2	0.22	0.65	8, 80	<.05
13, 7, 12, 11, 2, 4	0.25	0.48	7, 80	<.05
13, 7, 12, 11, 2, 4, 9	0.28	0.42	6, 80	<.05
13, 7, 12, 11, 2, 4, 9, 1	0.30		5, 80	<.05
13, 7, 12, 11, 2, 4, 9, 1, 8,	0.31	0.41	4, 80	<.05

TABLE 11 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	R stepwise	F*	df	P
13, 7, 12, 11, 2, 4, 9, 1, 8, 6,	0.32	0.27	3, 80	<.05
13, 7, 12, 11, 2, 4, 9, 1, 8, 6, 3,	0.33	0.12	2, 80	<.05
13, 7, 12, 11, 2, 4, 9, 1, 8, 6, 3, 10,	0.33	0.06	1, 80	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

TABLE 12

Zero Order Intercorrelation Matrix of Variables
For Total Sample of Boys (N = 47)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Criterion	.46**	.31*	.36*	.36*	.64**	.35*	.55**	.63**	.54**	.36*	.41**	.30*
MRT												
1 Word Meaning		.64**	.68**	.39**	.51**	.37**	.81**	.44**	.50**	.41**	.30*	.34*
2 Sentences			.71**	.37**	.47**	.25	.71**	.40**	.42**	.35*	.26	.25
3 Information				.52**	.59**	.46**	.84**	.53**	.44**	.45**	.32*	.32*
4 Matching					.63**	.47**	.69**	.48**	.49**	.45**	.40**	.32*
5 Numbers						.48**	.80**	.71**	.61**	.39**	.44**	.40**
6 Copying							.61**	.49**	.46**	.31*	.35*	.31*
7 Total								.66**	.62**	.53**	.49**	.50**
MAT												
8 Word Knowledge									.83**	.67**	.40**	.37**
9 Word Discrimination										.67**	.43**	.41**
10 Reading											.26	.31*
CTMM												
11 Non Language												.91**
12 Total Data												

*Significant at .05 level
**Significant at .01 level

ranged from .25 to .91. The only predictor variables not significantly related were: MRT Sentences and CTMM Non Language; MRT Sentences and CTMM Total; and MAT Reading and CTMM Non Language. The criterion variable was significantly correlated with all the variables.

The results obtained in the multiple regression analysis appear in Table 13. The significant multiple correlation coefficient was .77 ($F = 4.14$; $df = 12, 34$; $P > .05$) and supported the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 14. An inspection of these data indicated that step wise R including variables CTMM Non Language, CTMM Total, and MRT Numbers was not significantly different from the overall multiple R which included all the predictor variables. Therefore, the above three variables predicted the criterion with the same degree of accuracy as the multiple R and were potent predictors of the criterion.

Hypothesis three. There is a significant relationship between the predictor varialbes (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of girls.

The zero order intercorrelation coefficient matrix is presented in Table 15. The individual coefficients

TABLE 13

Multiple Regression Analysis
For Total Sample of Boys
(N = 47)

Variable	Mean	SD	Predictor Variables: Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	13.89	3.86	1.22	0.28	1.10
2 Sentences	8.89	3.05	-0.64	-0.12	1.02
3 Information	10.89	3.07	-1.28	-0.23	1.25
4 Matching	14.38	4.40	-0.68	-0.17	0.73
5 Numbers	12.28	5.24	1.21	0.38	0.76
6 Copying	7.06	2.97	-0.34	-0.06	0.93
7 Total	66.70	18.61	0.19	0.21	0.53
MAT					
8 Word Knowledge	20.36	8.55	0.72	0.37	0.49
9 Word Discrimination	21.66	8.15	-0.11	-0.05	0.46
10 Reading	19.04	9.27	0.06	0.03	0.31

TABLE 13 (Continued)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Non Language	28.76	4.81	2.44	0.70	1.02
12 Total Data	29.76	3.79	-2.82	-0.63	2.11

Criterion Variable					
Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	133.45	16.85	0.77*	12.49	120.86

*Significant at the .01 level

TABLE 14

Step Wise Multiple Regression Analysis
For the Total Sample of Boys
(N = 47)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Non Language
12 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
11	0.41	3.26	11, 34	>.05
11, 12	0.44	3.31	10, 34	>.05
11, 12, 5	0.68	1.18	9, 34	<.05
11, 12, 5, 8	0.72	0.74	8, 34	<.05
11, 12, 5, 8, 1	0.74	0.57	7, 34	<.05
11, 12, 5, 8, 1, 3	0.76	0.25	6, 34	<.05
11, 12, 5, 8, 1, 3, 7	0.76	0.26	5, 34	<.05
11, 12, 5, 8, 1, 3, 7, 4	0.76	0.15	4, 34	<.05
11, 12, 5, 8, 1, 3, 7, 4, 2	0.77	0.09	3, 34	<.05

TABLE 14 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Non Language
12 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
11, 12, 5, 8, 1, 3, 7, 4, 2, 6	0.77	0.04	2, 34	<.05
11, 12, 5, 8, 1, 3, 7, 4, 2, 6, 9	0.77	0.03	1, 34	<.05

*F ratio testing $H_o : R_{stepwise} = R_{total}$

TABLE 14 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Non Language
12 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
11, 12, 5, 8, 1, 3, 7, 4, 2, 6	0.77	0.04	2, 34	<.05
11, 12, 5, 8, 1, 3, 7, 4, 2, 6, 9	0.77	0.03	1, 34	<.05

*F ratio testing $H_o : R_{stepwise} = R_{total}$

TABLE 15

Zero Order Intercorrelation Matrix of Variables
For Total Sample of Girls (N = 47)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.19	-.29*	-.16	-.09	-.05	-.03	-.15	-.06	.05	.03	-.07	.01	-.03
MRT													
1 Word Meaning		.63**	.68**	.33*	.42**	.41**	.80**	.39**	.31*	.30*	.35*	.35*	.42**
2 Sentences			.74**	.29*	.41**	.34*	.76**	.29*	.26	.04	.34*	.37**	.44**
3 Information				.37**	.46**	.24	.77**	.33*	.34*	.22	.35*	.44**	.50**
4 Matching					.49**	.58**	.68**	.36*	.33*	.49**	.28	.58**	.57**
5 Numbers						.41**	.67**	.27	.22	.36*	.20	.36*	.37**
6 Copying							.79**	.54**	.45**	.36*	.19	.39**	.38**
7 Total								.53**	.47**	.40**	.39**	.56**	.60**
MAT													
8 Word Knowledge									.84**	.56**	.32*	.53**	.55**
9 Word Discrimination										.50**	.30*	.61**	.59**
10 Reading											.22	.43**	.42**

TABLE 15 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.19	-.29*	-.16	-.09	-.05	-.03	-.15	-.06	.05	.03	-.07	.01	-.03
CTMM													
11 Language												.29*	.72**
12 Non Language													.87**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

ranged from -.29 to .87. The predictor variables were highly intercorrelated; MRT Word Meaning, MRT Total, CTMM Non Language, and CTMM Total Data were significantly correlated with all the predictor variables. The criterion variable was found to be significantly correlated only with MRT Word Meaning.

The results obtained in the multiple regression analysis appear in Table 16. The non significant multiple correlation coefficient was .46 ($F = .070$; $df = 13, 33$; $P < .05$) and did not support the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 17. An inspection of these data indicated that step wise R using the most potent predictor variable, MRT Total, was not significantly different from the overall multiple R which included all the variables. Therefore, the independent variables proved not to be potent predictors of the criterion.

Hypothesis four. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading for the total sample of Social Class IV students.

The zero order intercorrelation coefficient matrix is presented in Table 18. Individual coefficients ranged

TABLE 16

Multiple Regression Analysis
For Total Sample of Girls
(N = 47)

Variable	Mean	SD	Predictor Variables: Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	12.34	3.67	-7.56	-0.56	5.71
2 Sentences	8.76	2.49	-15.82	-0.79	7.37
3 Information	9.85	2.89	-4.15	-0.24	6.15
4 Matching	12.89	4.01	-8.29	-0.66	4.61
5 Numbers	11.08	4.29	-2.59	-0.22	3.18
6 Copying	5.57	2.91	-4.65	-0.27	6.33
7 Total	60.89	15.23	5.99	1.83	3.84
MAT					
8 Word Knowledge	19.19	7.20	-2.51	-0.36	2.28
9 Word Discrimination	20.53	7.11	1.24	0.18	2.31
10 Reading	17.87	8.36	0.48	0.08	1.32

TABLE 16 (Continued)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	27.91	3.95	-9.04	-0.71	17.76
12 Non Language	26.81	5.60	-8.20	-0.92	17.80
13 Total Data	27.64	3.82	19.75	1.51	35.80

Criterion Variable					
Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	133.45	16.85	0.46	12.64	120.85

TABLE 17

Step Wise Multiple Regression Analysis
For the Total Sample of Girls
(N = 47)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
7,	0.15	0.67	12, 33	< .05
7, 13,	0.17	0.71	11, 33	<.05
7, 13, 12,	0.19	0.76	10, 33	<.05
7, 13, 12, 2,	0.31	0.54	9, 33	<.05
7, 13, 12, 2, 11,	0.32	0.58	8, 33	<.05
7, 13, 12, 2, 11, 4,	0.37	0.46	7, 33	<.05
7, 13, 12, 2, 11, 4, 1,	0.40	0.36	6, 33	<.05
7, 13, 12, 2, 11, 4, 1, 8,	0.43	0.28	5, 33	<.05
7, 13, 12, 2, 11, 4, 1, 8, 6,	0.43	0.33	4, 33	<.05
7, 13, 12, 2, 11, 4, 1, 8, 6, 3,	0.43	0.39	3, 33	<.05

TABLE 17 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
7, 13, 12, 2, 11, 4, 1, 8, 6, 3, 5,	0.45	0.22	2, 33	<.05
7, 13, 12, 2, 11, 4, 1, 8, 6, 3, 5, 9	0.46	0.13	1, 33	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

TABLE 18

Zero Order Intercorrelation Matrix of Variables
For Total Sample of Social Class IV
(N = 37)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.52**	.45**	.53**	.52**	.33*	.43**	.68**	.57**	.63**	.41*	.19	.53**	.46**
MRT													
1 Word Meaning		.61**	.68**	.41*	.43**	.33*	.79**	.51**	.51**	.28	.15	.54**	.42**
2 Sentences			.68**	.27	.32*	.18	.66**	.42**	.45**	.20	.23	.49**	.43**
3 Information				.47**	.54**	.44**	.82**	.55**	.52**	.34*	.09	.48**	.37*
4 Matching					.61**	.46**	.73**	.34*	.37*	.40*	.38*	.54**	.55**
5 Numbers						.35*	.70**	.40*	.35*	.38*	.19	.38*	.35*
6 Copying							.65**	.61**	.55**	.26	.09	.34*	.28
7 Total								.67**	.66**	.40**	.27	.61**	.54**
MAT													
8 Word Knowledge									.89**	.62**	.25	.41*	.41*
9 Word Discrimination										.63**	.32*	.50**	.50**
10 Reading											.61**	.35*	.44**

TABLE 18 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.52**	.45**	.53**	.52**	.33*	.43**	.68**	.57**	.63**	.41*	.19	.53**	.46**
CTMM													
11 Language												.49**	.81**
12 Non Language													.91**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

from .09 to .91. The predictor variables MAT Word Discrimination and CTMM Non Language were significantly correlated with all the variables. The predictor variable CTMM Language was significantly correlated only with MRT Matching, MAT Word Discrimination, MAT Reading, CTMM Non Language, and CTMM Total Data. The criterion variable was significantly correlated with all the predictor variables except CTMM Language.

The results obtained in the multiple regression analysis appear in Table 19. The significant multiple correlation coefficient was .81 ($F = 3.65$; $df = 13, 23$; $P > .05$) and supported the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 20. An inspection of these data indicated that step wise R including variables CTMM Total Data and MRT Total Data, was not significantly different from the overall multiple R which included all the predictor variables. Therefore, the above two variables predicted the criterion with the same degree of accuracy as the multiple R and were potent predictors of the criterion.

Hypothesis five. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data,

TABLE 19

Multiple Regression Analysis
For Total Sample of
Social Class IV
(N = 37)

Variable	Mean	SD	Predictor Variables: Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	13.92	3.23	-2.19	-0.40	1.59
2 Sentences	9.54	2.37	-2.05	-0.28	1.83
3 Information	11.13	2.33	-2.08	-0.28	1.87
4 Matching	14.05	4.06	-0.53	-0.12	1.22
5 Numbers	11.84	4.74	-2.02	-0.55	0.82
6 Copying	6.43	3.31	-2.92	-0.55	1.42
7 Total	67.46	14.96	2.32	1.97	0.95
MAT					
8 Word Knowledge	21.24	8.22	-0.02	-0.01	0.65
9 Word Discrimination	22.35	7.73	0.47	0.21	0.66
10 Reading	19.19	9.55	0.24	0.13	0.34

TABLE 19 (Continued)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	29.49	3.57	-8.90	-1.81	4.87
12 Non Language	27.89	5.00	-6.86	-1.95	4.85
13 Total Data	28.86	3.67	15.66	3.27	9.71

Criterion Variable					
Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	133.92	17.57	0.82*	12.56	87.90

*Significant at .01 level

TABLE 20

Step Wise Multiple Regression Analysis
For Total Sample of Social Class IV
(N = 37)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13,	0.46	2.72	12, 23	>.05
13, 7,	0.69	1.29	11, 23	<.05
13, 7, 12,	0.69	1.34	10, 23	<.05
13, 7, 12, 11,	0.72	1.21	9, 23	<.05
13, 7, 12, 11, 6,	0.72	1.33	8, 23	<.05
13, 7, 12, 11, 6, 5,	0.76	0.99	7, 23	<.05
13, 7, 12, 11, 6, 5, 1,	0.77	1.01	6, 23	<.05
13, 7, 12, 11, 6, 5, 1, 2,	0.78	0.91	5, 23	<.05
13, 7, 12, 11, 6, 5, 1, 2, 3,	0.79	0.95	4, 23	<.05

TABLE 20 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13, 7, 12, 11, 6, 5, 1, 2, 3, 9,	0.81	0.20	3, 23	<.05
13, 7, 12, 11, 6, 5, 1, 2, 3, 9, 10,	0.82	0.10	2, 23	<.05
13, 7, 12, 11, 6, 5, 1, 2, 3, 9, 10, 4	0.82	0.004	1, 23	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of Social Class V students.

The zero order intercorrelation coefficient matrix is presented in Table 21. Individual coefficients ranged from -.20 to .88. All the correlations between the predictor variables were significant except between: (1) MRT Sentences and MAT Reading; (2) MRT Sentences and CTMM Language; (3) MRT Sentences and CTMM Non Language; (4) MRT Matching and CTMM Language; and (5) MAT Reading and CTMM Language. None of the predictor variables were significantly correlated with the criterion variable.

The results obtained in the multiple regression analysis appear in Table 22. The non significant multiple correlation coefficient was .40 ($F = .65$; $df = 13, 43$; $P < .05$) and did not support the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 23. An inspection of these data indicated that step wise R utilizing the most potent predictor variable, CTMM Total Data, was not significantly different from the overall multiple R which included all the variables. Therefore, the independent variables proved not to be potent predictors of the criterion.

Hypothesis six. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT

TABLE 21

Zero Order Intercorrelation Matrix of Variables
For Total Sample of Social Class V
(N = 57)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.13	-.20	-.12	-.09	.08	-.06	-.08	.01	.06	.03	-.10	-.02	-.06
MRT													
1 Word Meaning		.61**	.69**	.37**	.51**	.49**	.81**	.36**	.35**	.41**	.45**	.27*	.41**
2 Sentences			.71**	.36**	.52**	.36**	.73**	.29*	.28*	.22	.25	.23	.28*
3 Information				.46**	.56**	.37**	.80**	.38**	.33*	.36**	.41**	.38**	.47**
4 Matching					.56**	.60**	.68**	.49**	.44**	.52**	.17	.49**	.42**
5 Numbers						.55**	.79**	.62**	.52**	.39**	.27*	.42**	.43**
6 Copying							.69**	.44**	.39**	.49**	.33*	.44**	.46**
7 Total								.57**	.50**	.52**	.46**	.50**	.57**
MAT													
8 Word Knowledge									.79**	.63**	.28*	.50**	.48**
9 Word Discrimination										.56**	.28*	.54**	.50**
10 Reading											.18	.35**	.32*

TABLE 21 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.13	-.20	-.12	-.09	.08	-.06	-.08	.01	.06	.03	-.10	-.02	-.06
CTMM													
11 Language												.42**	.79**
12 Non Language													.8[illegible]**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

TABLE 22

Multiple Regression Analysis
For Total Sample of
Social Class V
(N = 57)

Variable	Mean	SD	Predictor Variables: Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	12.60	4.11	-2.60	-0.23	3.47
2 Sentences	8.37	2.93	-5.78	-0.37	3.91
3 Information	9.88	3.31	-0.50	-0.03	3.74
4 Matching	13.37	4.38	-3.54	-0.34	2.55
5 Numbers	11.58	4.87	2.68	0.28	2.70
6 Copying	6.24	2.83	-1.15	-0.07	3.56
7 Total	61.42	18.19	1.21	0.48	1.82
MAT					
8 Word Knowledge	18.82	7.57	-1.69	-0.28	1.65
9 Word Discrimination	20.28	7.51	1.39	0.23	1.49
10 Reading	17.98	8.33	0.79	0.14	1.17

TABLE 22 (Continued)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	28.93	4.35	-11.13	-1.06	14.13
12 Non Language	27.72	5.50	-10.37	-1.25	14.33
13 Total Data	28.60	4.13	20.47	1.84	28.76

Criterion Variable					
Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	137.16	45.68	0.40	47.64	185.91

TABLE 23

Step Wise Multiple Regression Analysis
For the Total Sample of Social Class V
(N = 57)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13,	0.06	0.69	12, 43	< .05
13, 12	0.09	0.73	11, 43	< .05
13, 12, 11,	0.13	0.75	10, 43	< .05
13, 12, 11, 7,	0.15	0.82	9, 43	<.05
13, 12, 11, 7, 2	0.25	0.64	8, 43	<.05
13, 12, 11, 7, 2, 4,	0.31	0.52	7, 43	<.05
13, 12, 11, 7, 2, 4, 5,	0.35	0.33	6, 43	<.05
13, 12, 11, 7, 2, 4, 5, 8,	0.36	0.39	5, 43	<.05
13, 12, 11, 7, 2, 4, 5, 8, 1,	0.36	0.41	4, 43	<.05

TABLE 23 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13, 12, 11, 7, 2, 4, 5, 8, 1, 9,	0.39	0.20	3, 43	<.05
13, 12, 11, 7, 2, 4, 5, 8, 1, 9, 10,	0.40	0.05	2, 43	<.05
13, 12, 11, 7, 2, 4, 5, 8, 1, 9, 10, 6,	0.40	0.02	1, 43	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of Social Class IV boys.

The zero order intercorrelation coefficient matrix is presented in Table 24. Individual coefficients ranged from being highly related, r = .93, to having no relationship, r = .00. The predictor variables which had the fewest significant intercorrelations were: (1) CTMM Language was significantly related only to the other CTMM measures; and (2) MAT Reading was significantly correlated to the other MAT measures, as well as MRT Word Knowledge and MRT Total. The predictor variables which were significantly intercorrelated with the most predictor variables were: (1) MRT Total was significantly correlated with all except CTMM Language; and (2) MAT Word Discrimination correlated significantly with all except CTMM Language. The correlations between the predictor variables and the criterion variable were significant except for MRT Copying, CTMM Language, and CTMM Total. A total lack of correlation was shown between the CTMM Language and the criterion variable.

The results obtained in the multiple regression analysis appear in Table 25. The non significant multiple

TABLE 24

Zero Order Intercorrelation Matrix of Variables
For Social Class IV Boys (N = 21)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.49*	.52*	.59**	.49*	.61**	.36	.66**	.66**	.60**	.43*	.00	.47*	.33
MRT													
1 Word Meaning		.64**	.68**	.41	.65**	.28	.75**	.59**	.58**	.44*	.38	.46*	.45*
2 Sentences			.68**	.40	.59**	.15	.79**	.52*	.54*	.31	.33	.49*	.47*
3 Information				.53*	.70**	.54*	.86**	.75**	.64**	.40	.15	.40	.35
4 Matching					.60**	.44*	.76**	.52*	.46*	.42	.27	.46*	.43*
5 Numbers						.50*	.89**	.78**	.65**	.36	.36	.41	.44*
6 Copying							.66**	.69**	.49*	.38	.12	.32	.28
7 Total								.84**	.72**	.49*	.34	.54*	.52*
MAT													
8 Word Knowledge									.85**	.69**	.25	.38	.38
9 Word Discrimination										.69**	.36	.46*	.48*
10 Reading											.38	.28	.36

TABLE 24 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.49*	.52*	.59**	.49*	.61**	.36	.66**	.66**	.60**	.43*	.00	.47*	.33
CTMM													
11 Language												.57**	.83**
12 Non Language													.93**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

TABLE 25

Multiple Regression Analysis
For The Total Sample of
Social Class IV Boys
(N = 21)

Variable	Mean	SD	Predictor Variables: Partial Regression Coefficient	Predictor Variables: Standard Partial Regression Coefficient	Predictor Variables: S.E. of Regression Coefficient
MRT					
1 Word Meaning	14.48	2.40	-2.37	-0.36	134.81
2 Sentences	9.53	2.54	-0.32	-0.05	134.81
3 Information	11.43	2.48	-2.35	-0.37	134.82
4 Matching	15.14	3.62	-1.50	-0.35	134.81
5 Numbers	12.05	4.61	0.10	0.03	134.80
6 Copying	6.86	3.48	-2.41	-0.54	134.80
7 Total	69.48	14.88	1.73	1.66	134.80
MAT					
8 Word Knowledge	21.09	8.32	0.09	0.05	1.27
9 Word Discrimination	21.81	7.43	0.02	0.01	0.81
10 Reading	19.24	10.27	0.57	0.37	0.54

TABLE 25 (Continued)

Predictor Variables

Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	29.86	3.73	-9.24	-2.21	6.92
12 Non Language	28.19	5.60	-5.18	-1.86	6.67
13 Total Data	29.19	4.12	13.31	3.52	13.39

Criterion Variable

Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	134.09	15.56	0.88	12.32	136.08

correlation coefficient was .88 ($F = 1.91$; $df = 13, 7$; $P < .05$) and did not support the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 26. An inspection of these data indicated that step wise R utilizing the most potent predictor variable, CTMM Total Data, was not significantly different from the overall multiple R which included all the variables. Therefore, the independent variables proved not to be potent predictors of the criterion.

Hypothesis seven. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of Social Class IV girls.

The zero order intercorrelation coefficient matrix is presented in Table 27. Individual coefficients ranged from -.06 to .94. The following predictor variables had the fewest significant correlations: (1) CTMM Language was significantly correlated only with the CTMM Total; and (2) MRT Numbers was significantly correlated with MRT Matching. The predictor variable MRT Total was significantly correlated with all the predictor variables except

TABLE 26

Step Wise Multiple Regression Analysis
For The Total Sample of
Social Class IV Boys
(N = 21)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13,	0.32	1.79	12, 7	<.05
13, 11	0.52	1.29	11, 7	<.05
13, 11, 12,	0.59	1.37	10, 7	<.05
13, 11, 12, 7,	0.77	0.68	9, 7	<.05
13, 11, 12, 7, 6,	0.78	0.66	8, 7	<.05
13, 11, 12, 7, 6, 3,	0.79	0.72	7, 7	<.05
13, 11, 12, 7, 6, 3, 10,	0.83	0.47	6, 7	<.05
13, 11, 12, 7, 6, 3, 10, 1,	0.84	0.51	5, 7	<.05
13, 11, 12, 7, 6, 3, 10, 1, 4,	0.85	0.40	4, 7	<.05

TABLE 26 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13, 11, 12, 7, 6, 3, 10, 1, 4, 2,	0.85	0.52	3, 7	<.05
13, 11, 12, 7, 6, 3, 10, 1, 4, 2, 8,	0.85	0.78	2, 7	<.05
13, 11, 12, 7, 6, 3, 10, 1, 4, 2, 8, 5	0.82	3.36	1, 7	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

TABLE 27

Zero Order Intercorrelation Matrix of Variables
For Social Class IV Girls (N = 16)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.56*	.39	.50	.58*	.08	.52*	.72**	.50*	.67**	.39	.40	.67**	.69**
MRT													
1 Word Meaning		.68**	.73**	.36	.29	.36	.85**	.50*	.53*	.16	-.03	.71**	.44
2 Sentences			.69**	.14	-.05	.23	.63**	.27	.35	.02	.07	.51*	.37
3 Information				.35	.32	.23	.75**	.26	.42	.25	-.06	.63**	.37
4 Matching					.66**	.45	.69**	.20	.39	.44	.49	.72**	.76**
5 Numbers						.14	.46	-.06	.04	.41	-.04	.34	.21
6 Copying							.63**	.53*	.69**	.04	.01	.37	.27
7 Total								.46	.63**	.28	.15	.75**	.58*
MAT													
8 Word Knowledge									.94**	.52*	.26	.50*	.49
9 Word Discrimination										.57*	.30	.60*	.58*
10 Reading											.46	.49	.61*

TABLE 27 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.56*	.39	.50	.58*	.08	.52*	.72**	.50*	.67**	.39	.40	.67**	.69**
CTMM													
11 Language												.33	.77**
12 Non Language													.85**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

MRT Numbers, MAT Word Knowledge, and CTMM Language. The correlation coefficients between the criterion variable and the predictor variables were significant except with MRT Sentences, MRT Numbers, MAT Reading and CTMM Language.

The results obtained in the multiple regression analysis appear in Table 28. The significant multiple correlation coefficient was .99 ($F = 14.92$; $df = 13, 2$; $P > .05$) and supported the hypothesis. A step wise multiple regression analysis was then performed and the results of the analysis are presented in Table 29. An inspection of these data indicated that step wise R including variables CTMM Total, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total, MRT Sentences, MRT Copying, and MAT Reading was not significantly different from the overall multiple R which included all the predictor variables. Therefore, the above nine variables predicted the criterion with the same degree of accuracy as the multiple R and were potent predictors of the criterion.

Hypothesis eight. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of Social Class V boys.

TABLE 28

Multiple Regression Analysis
For The Total Sample of
Social Class IV Girls
(N = 16)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	13.19	4.05	2.79	0.55	2.88
2 Sentences	9.56	2.22	-7.07	-0.77	2.32
3 Information	10.75	2.14	-0.99	-0.10	2.21
4 Matching	12.62	4.27	-2.56	-0.54	4.55
5 Numbers	11.56	5.05	-0.77	-0.19	2.29
6 Copying	5.76	3.09	-4.46	-0.67	3.19
7 Total	64.81	15.11	1.35	1.00	1.03
MAT					
8 Word Knowledge	21.44	8.34	-4.31	-1.76	1.35
9 Word Discrimination	23.06	8.31	5.56	2.26	2.58
10 Reading	19.12	8.84	-1.44	-0.62	1.49

TABLE 28 (Continued)

Predictor Variables

Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	29.00	3.40	-26.54	-4.42	6.12
12 Non Language	27.50	4.23	-28.10	-5.81	5.91
13 Total Data	28.44	3.05	60.92	9.10	15.95

Criterion Variable

Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	133.69	20.45	0.99*	5.66	-43.11

*Significant at .01 level

TABLE 29

Step Wise Multiple Regression Analysis
For The Total Sample of
Social Class IV Girls

(N = 16)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13,	0.69	8.45	12, 2	>.01
13, 12,	0.70	8.77	11, 2	>.01
13, 12, 11	0.74	8.70	10, 2	>.01
13, 12, 11, 9,	0.78	8.14	9, 2	>.01
13, 12, 11, 9, 8,	0.83	7.23	8, 2	>.05
13, 12, 11, 9, 8, 7,	0.86	6.96	7, 2	>.05
13, 12, 11, 9, 8, 7, 2,	0.86	8.06	6, 2	>.05
13, 12, 11, 9, 8, 7, 2, 6,	0.87	9.36	5, 2	>.05
13, 12, 11, 9, 8, 7, 2, 6, 10,	0.96	3.72	4, 2	<.05

TABLE 29 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13, 12, 11, 9, 8, 7, 2, 6, 10, 1,	0.98	2.30	3, 2	<.05
13, 12, 11, 9, 8, 7, 2, 6, 10, 1, 4,	0.99	0.36	2, 2	<.05
13, 12, 11, 9, 8, 7, 2, 6, 10, 1, 4, 5	0.99	0.24	1, 2	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

The zero order intercorrelation coefficient matrix is presented in Table 30. The individual coefficients ranged from -.39 to .88. The predictor variables which had the fewest significant correlations were: (1) MAT Word Discrimination was significantly correlated with the other MAT measures as well as MRT Numbers, CTMM Non Language, and CTMM Total; and (2) CTMM Language was significantly correlated with MRT Word Meaning, MRT Sentences, MRT Information and CTMM Total. The variable MRT Total was significantly correlated with all the predictor variables except MAT Word Discrimination. All of the predictor variables were negatively correlated with the criterion variable and the only significant correlations were with the predictor variables of MRT Word Meaning and MRT Sentences.

The results obtained in the multiple regression analysis appear in Table 31. The non significant multiple correlation coefficient was .82 ($F = 1.90$; $df = 13, 7$; $P < .05$) and did not support the hypothesis. A step wise multiple regression analysis was then performed and the results of this analysis are presented in Table 32. An inspection of these data indicated that step wise R utilizing the most potent predictor variable, CTMM Total Data, was not significantly different from the overall multiple R which included all the variables. Therefore, the independent variables proved not to be potent predictors of the criterion.

TABLE 30

Zero Order Intercorrelation Matrix of Variables
For Social Class V Boys (N = 26)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.46*	.20	.24	.30	.66**	.36	.51**	.62**	.51**	.32	.11	.39*	.29
MAT													
1 Word Meaning		.64**	.69**	.38	.49*	.51**	.84**	.39*	.49*	.45*	.35	.29	.36
2 Sentences			.70**	.33	.44*	.39*	.79**	.32	.37	.40	.14	.15	.16
3 Information				.50**	.56**	.47*	.83**	.41*	.35	.51**	.33	.33	.38
4 Matching					.67**	.57**	.66**	.46*	.51**	.49*	.08	.43*	.31
5 Numbers						.50**	.77**	.67**	.59**	.44*	.16	.48*	.38
6 Copying							.66**	.32	.47*	.21	.19	.38	.34
7 Total								.57**	.59**	.59**	.43*	.54**	.56**
MAT													
8 Word Knowledge									.81**	.67**	.21	.46*	.40*
9 Word Discrimination										.66**	.23	.44*	.38
10 Reading											.2?	.25	.26

TABLE 30 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	.46*	.20	.24	.30	.66**	.36	.51**	.62**	.51**	.32	.11	.39*	.29
CTMM													
11 Language												.54**	.86**
12 Non Language													.89**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

TABLE 31

Multiple Regression Analysis
For The Total Sample of
Social Class V Boys
(N = 26)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	13.42	4.72	2.50	0.65	1.77
2 Sentences	8.38	3.37	-0.56	-0.10	1.65
3 Information	10.46	3.47	-1.45	-0.28	1.77
4 Matching	13.77	4.92	-0.87	-0.24	1.10
5 Numbers	12.46	4.78	2.40	0.77	1.39
6 Copying	7.23	2.53	1.67	0.23	2.19
7 Total	64.46	21.17	-0.46	-0.54	0.96
MAT					
8 Word Knowledge	19.77	8.84	0.85	0.41	0.76
9 Word Discrimination	21.54	8.84	-0.58	-0.28	0.81
10 Reading	18.88	8.59	0.29	0.14	0.73

TABLE 31 (Continued)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	30.81	3.88	2.21	0.47	6.76
12 Non Language	29.23	4.13	3.47	0.79	7.03
13 Total Data	30.23	3.51	-5.28	-1.02	13.56

Criterion Variable					
Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	132.92	18.11	0.82	14.95	99.33

TABLE 32

Step Wise Multiple Regression Analysis
For The Total Sample of
Social Class V Boys
(N = 21)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13,	0.29	1.79	12, 12	<.05
13, 12,	0.40	1.71	11, 12	<.05
13, 12, 5,	0.67	0.83	10, 12	<.05
13, 12, 5, 1,	0.69	0.79	9, 12	<.05
13, 12, 5, 1, 7,	0.75	0.52	8, 12	<.05
13, 12, 5, 1, 7, 11,	0.75	0.59	7, 12	<.05
13, 12, 5, 1, 7, 11, 8,	0.77	0.44	6, 12	<.05
13, 12, 5, 1, 7, 11, 8, 9,	0.78	0.48	5, 12	<.05
13, 12, 5, 1, 7, 11, 8, 9, 3,	0.80	0.33	4, 12	<.05

TABLE 32 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13, 12, 5, 1, 7, 11, 8, 9, 3, 4,	0.80	0.32	3, 12	<.05
13, 12, 5, 1, 7, 11, 8, 9, 3, 4, 6,	0.81	0.20	2, 12	<.05
13, 12, 5, 1, 7, 11, 8, 9, 3, 4, 6, 10	0.82	0.11	1, 12	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

Hypothesis nine. There is a significant relationship between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample of Social Class V girls.

The zero order intercorrelation coefficient matrix is presented in Table 33. The individual coefficients ranged from -.39 to .88. The predictor variables which had the fewest significant correlations were: (1) CTMM Language was significantly correlated with MRT Word Meaning, MRT Sentences, MRT Information and CTMM Total; and (2) MAT Word Discrimination was significantly correlated with the MAT measures, MRT Numbers, CTMM Non Language and CTMM Total. The predictor variable MRT Total was significantly correlated with all the predictor variables except MAT Word Discrimination. All of the predictor variables were negatively correlated with the criterion variable and the only significant correlation coefficients were the predictor variables of MRT Word Meaning and MRT Sentences.

The results obtained in the multiple regression analysis appear in Table 34. The non significant multiple correlation coefficient was .65 ($F = 0.93$; $df = 13, 7$; $P < .05$) and did not support the hypothesis. A step wise

TABLE 33

Zero Order Intercorrelation Matrix of Variables
For Social Class V Girls (N = 31)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.36*	-.39*	-.22	-.23	-.08	-.13	-.30	-.18	-.06	-.03	-.13	-.06	-.10
MRT													
1 Word Meaning		.60**	.67**	.33	.50**	.44*	.76**	.27	.08	.36*	.51**	.21	.40*
2 Sentences			.74**	.40*	.67**	.38*	.80**	.25	.13	.01	.40*	.32	.44*
3 Information				.41*	.54**	.24	.77**	.32	.27	.18	.43*	.39*	.51**
4 Matching					.39*	.66**	.71**	.52**	.34	.54**	.21	.56**	.53**
5 Numbers						.59**	.81**	.53**	.36*	.32	.31	.39*	.45*
6 Copying							.73**	.56**	.27	.54**	.26	.40*	.43*
7 Total								.55**	.33	.45*	.46**	.50**	.61**
MAT													
8 Word Knowledge									.74**	.58**	.32	.57**	.58**
9 Word Discrimination										.43*	.25	.67**	.62**
10 Reading											.09	.41*	.34

TABLE 33 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Criterion	-.36*	-.39*	-.22	-.23	-.08	-.13	-.30	-.18	-.06	-.03	-.13	-.06	-.10
CTMM													
11 Language												.27	.69**
12 Non Language													.88**
13 Total Data													

*Significant at .05 level
**Significant at .01 level

TABLE 34

Multiple Regression Analysis
For The Total Sample of
Social Class V Girls
(N = 31)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
MRT					
1 Word Meaning	11.90	3.45	-15.02	-0.86	39.11
2 Sentences	8.35	2.56	-21.37	-0.91	41.08
3 Information	9.39	3.14	5.45	0.28	39.19
4 Matching	13.03	3.93	-7.20	-0.47	37.04
5 Numbers	10.84	3.91	3.86	0.25	37.11
6 Copying	5.42	2.85	0.06	0.00	41.95
7 Total	58.87	15.14	4.10	1.03	38.46
MAT					
8 Word Knowledge	18.03	6.37	-3.82	-0.40	3.37
9 Word Discrimination	19.22	6.14	-1.48	-0.15	3.42
10 Reading	17.22	8.17	1.10	0.15	2.31

TABLE 34 (Continued)

Predictor Variables					
Variable	Mean	SD	Partial Regression Coefficient	Standard Partial Regression Coefficient	S.E. of Regression Coefficient
CTMM					
11 Language	27.35	4.14	16.09	1.11	31.56
12 Non Language	26.45	6.22	14.61	1.52	31.13
13 Total Data	27.22	4.15	-26.17	-1.81	62.31

Criterion Variable					
Variable	Mean	SD	R	$S.E._{est}$	Intercept Constant
Reading Achievement	140.71	59.95	0.64	60.87	221.304

multiple regression analysis was then performed and the results of this analysis are presented in Table 35. An inspection of these data indicated that step wise R using the most potent predictor variable, CTMM Total Data, was not significantly different from the overall multiple R which included all the variables. Therefore, the independent variables proved not to be potent predictors of the criterion.

Predictive Devices

The significant multiple regression analyses were reported in Tables 13, 19, and 26 for the total sample of boys, total sample of Social Class IV, and total sample of Social Class IV girls. The following equation may be utilized for predictive purposes:

$$CV' = PV_1 \cdot RC_1 + PV_2 \cdot RC_2 \ldots + PV_n \cdot RC_n + IC$$

in which

CV' = Predicted criterion variable score

PV = Predictor variable score

RC = Partial regression coefficient

IC = Intercept constant

Discussion of the Results

The multiple correlation coefficients for the samples investigated ranged from .34 to .99. Of the nine sub groups involved in this study, significant multiple correlation coefficients between predictor and criterion variables were secured for: (1) total sample of boys,

TABLE 35

Step Wise Multiple Regression Analysis
For The Total Sample of
Social Class V Girls
(N = 31)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13,	0.10	0.98	12, 17	<.05
13, 12,	0.12	0.21	11, 17	<.05
13, 12, 11,	0.16	1.14	10, 17	<.05
13, 12, 11, 7,	0.34	0.97	9, 17	<.05
13, 12, 11, 7, 2,	0.41	0.88	8, 17	<.05
13, 12, 11, 7, 2, 1,	0.46	0.85	7, 17	<.05
13, 12, 11, 7, 2, 1, 4,	0.55	0.56	6, 17	<.05
13, 12, 11, 7, 2, 1, 4, 8,	0.62	0.16	5, 17	<.05
13, 12, 11, 7, 2, 1, 4, 8, 3,	0.63	0.13	4, 17	<.05

TABLE 35 (Continued)

Predictor Variables

1 = MRT Word Meaning
2 = MRT Sentences
3 = MRT Information
4 = MRT Matching
5 = MRT Numbers
6 = MRT Copying
7 = MRT Total
8 = MAT Word Knowledge
9 = MAT Word Discrimination
10 = MAT Reading
11 = CTMM Language
12 = CTMM Non Language
13 = CTMM Total Data

Variables in Regression Analysis	$R_{stepwise}$	F*	df	P
13, 12, 11, 7, 2, 1, 4, 8, 3, 5,	0.63	0.13	3, 17	<.05
13, 12, 11, 7, 2, 1, 4, 8, 3, 5, 9,	0.64	0.11	2, 17	<.05
13, 12, 11, 7, 2, 1, 4, 8, 3, 5, 9, 10	0.64	0.003	1, 17	<.05

*F ratio testing H_o: $R_{stepwise} = R_{total}$

R = .77, N = 47; (2) total sample of Social Class IV, R = .82, N = 37; and (3) total sample of Social Class IV girls, R = .99, N = 16. These multiple Rs supported hypotheses two, four, and seven. In the analysis concerning hypothesis two, total sample of boys, an adjustment in the statistical technique was necessary. This adjustment entailed the elimination of the predictor variable CTMM Language.

The multiple correlation coefficients were not significant for: (1) total sample, R = .34, N = 94; (2) total sample of girls, R = .46, N = 47; (3) total sample of Social Class V, R = .40, N = 57; (4) total sample of Social Class IV boys, R = .88, N = 21; (5) total sample of Social Class V boys, R = .82, N = 26; and (6) total sample of Social Class V girls, R = .65, N = 31. The non significant multiple correlation coefficients were related to low correlations between the predictor variables and the criterion variable, high intercorrelations among the predictor variables, and the small sample size for certain groups (Garrett, 1964).

For the three sub groups with significant multiple Rs, the step wise multiple regression analyses isolated the following variables, rank ordered, as potent predictors of end of third grade reading achievement:

1. Total sample of boys

   CTMM Non Language, CTMM Total Data, and MRT Numbers.

2. Total sample of Social Class IV
   CTMM Total Data and MRT Total.
3. Total sample of Social Class IV girls
   CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total Data, MRT Sentences, MRT Copying, and MAT Reading.

The step wise multiple regression analyses revealed CTMM Total Data to be the most potent predictor for the total sample of Social Class IV and total sample of Social Class IV girls; it was the second most potent predictor for the total sample of boys. The CTMM was also found to be significantly related to reading achievement in research reported by Cooper (1950), Dizney & Fleming (1964), and Pomerantz (1970).

The variable CTMM Non Language was found to be a potent predictor of reading achievement in two of the samples. This variable was the most potent predictor for the total sample of boys and the second most potent predictor for the total sample of Social Class IV girls. It is possible that bilingualism of the subjects may have been reflected in this finding. This conclusion was supported in results reported by Caskey & Smith (1969), Cook & Arthur (1959), Cooper (1959), and Darcy (1963) all of whom concluded non verbal or non language scores on intelligence tests were a more valid measure of potential for bilingual students than verbal or language scores.

MRT Total was found to be a potent predictor of reading achievement for two of the sub samples. This variable ranked second in predictor potency for the total sample of Social Class IV and seventh in predictor potency for the total sample of Social Class IV girls. Research conducted by Mishra (1970) also found the MRT Total to be significantly related to third grade reading achievement for Mexican-American students from a poverty area in Tucson, Arizona.

The predictor variable MRT Numbers was a potent predictor of reading achievement only for the total sample of boys and ranked third in predictor potency. The investigations conducted by Kingston (1962) and Mishra (1970) also found MRT Numbers to be significantly related to third grade reading achievement.

The variables which were found to be potent predictors of reading achievement for the total sample of Social Class IV girls were: MAT Word Discrimination, MAT Word Knowledge, MRT Sentences, MRT Copying, and MAT Reading. All of these measures except MRT Copying required verbal or linguistic abilities. These results were consistent with the findings reported in Chapter II concerning the verbal advantage of girls over boys, for example, Anastasi & Foley (1949).

In summary, there were significant multiple correlation coefficients between the predictor variables and criterion variable for: (1) total sample of boys; (2) total sample of

Social Class IV; and (3) total sample of Social Class IV girls. For these three sub groups with significant multiple Rs, the step wise multiple regression analyses isolated the following variables as potent predictors of end of third grade reading achievement:

1. Total sample of boys

   CTMM Non Language, CTMM Total Data, and MRT Numbers.

2. Total sample of Social Class IV

   CTMM Total Data and MRT Total.

3. Total sample of Social Class IV girls

   CTMM Total Data, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total Data, MRT Sentences, MRT Copying, and MAT Reading.

CHAPTER V

Summary, Conclusions, and Recommendations

A summarization of the study, discussion of conclusions derived from the results of the investigation, and recommendations for further research are offered in this chapter.

Summary

Purpose. The purpose of this study was to determine if measures of first grade readiness, scholastic aptitude, and reading achievement were significant predictors of third grade reading achievement for Mexican-American students from two lower socioeconomic levels.

Design. The sample involved in this study included 94 students who, in May 1970, completed their third year in the Sustained Primary Program for Bilingual Students in Las Cruces, New Mexico. The criteria for selection of subjects were: (1) subjects were of Mexican-American descent; (2) subjects entered first grade in August 1967 and were born during the year 1961; (3) the sample was comprised of those students for whom readiness, scholastic aptitude, achievement test data, and information regarding the occupational and educational levels of the head of each household were available. The measures required were: (1) MRT administered at the beginning of first grade; (2) MAT Primary administered at the completion of first grade;

(3) CTMM administered at the completion of first grade; (4) MAT Elementary administered at the completion of third grade; and (5) socioeconomic classification obtained utilizing the Two Factor Index of Social Position (Hollingshead, 1965).

The criterion variable of third grade reading achievement was a composite reading achievement score derived by combining the standard scores received by an individual on the MAT Elementary subtests of Word Knowledge, Word Discrimination, and Reading. The thirteen predictor variables were: MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, and CTMM Total Data.

To isolate the variables which were the most potent predictors of third grade reading achievement, a step wise multiple regression analysis was performed for each of the following sub groups: (1) total sample; (2) total sample of boys; (3) total sample of girls; (4) total sample of Social Class IV; (5) total sample of Social Class V; (6) total sample of Social Class IV boys; (7) total sample of Social Class IV girls; (8) total sample of Social Class V boys; and (9) total sample of Social Class V girls.

The data germane to this study were reported for each sample group and included: (1) a zero order intercorrelation

coefficient matrix; (2) a multiple regression analysis; and (3) a step wise multiple regression analysis. The significance of the following statistics were then determined: zero order correlation coefficients; multiple correlation coefficients; and F ratios for differences between the step wise R and the overall R.

Results. The results obtained from testing the nine hypotheses were as follows:

1. Hypothesis one. The multiple correlation coefficient did not support the hypothesis that a significant relationship existed between the predictor variables (MRT Word Meaning, MRT Sentences, MRT Information, MRT Matching, MRT Numbers, MRT Copying, MRT Total Score, MAT Word Knowledge, MAT Word Discrimination, MAT Reading, CTMM Language Data, CTMM Non Language Data, CTMM Total Data) and the criterion variable reading achievement for the total sample. The step wise multiple regression analysis revealed that the independent variables were not potent predictors of the criterion.

2. Hypothesis two. The multiple correlation coefficient supported the hypothesis that a significant relationship existed between the predictor variables and the criterion variable of reading achievement for the total sample of boys. In this analysis, an adjustment in the statistical technique was necessary which entailed the elimination of predictor variable CTMM Language. The step

wise multiple regression analysis revealed that CTMM Non Language, CTMM Total Data and MRT Numbers predicted the criterion with the same degree of accuracy as the multiple R.

3. Hypothesis three. The multiple correlation coefficient did not support the hypothesis that a significant relationship existed between the predictor variables and the criterion variable reading achievement for the total sample of girls. The step wise multiple regression analysis revealed that the independent variables were not potent predictors of the criterion.

4. Hypothesis four. The multiple correlation coefficient supported the hypothesis that a significant relationship existed between the predictor variables and the criterion variable reading achievement for the total sample of Social Class IV. The step wise multiple regression analysis revealed that the independent variables CTMM Total Data and MRT Total Data predicted the criterion with the same degree of accuracy as the multiple R.

5. Hypothesis five. The multiple correlation coefficient did not support the hypothesis that a significant relationship existed between the predictor variables and the criterion variable reading achievement for the total sample of Social Class V. The step wise multiple regression analysis revealed that the independent variables were not potent predictors of the criterion.

6. Hypothesis six. The multiple correlation coefficient did not support the hypothesis that a significant

relationship existed between the predictor variables and the criterion variable reading achievement for the total sample of Social Class IV boys. The step wise multiple regression analysis revealed tha the independent variables were not potent predictors of the criterion.

7. Hypothesis seven. The multiple correlation coefficient supported the hypothesis that a significant relationship existed between the predictor variables and the criterion variable reading achievement for the total sample of Social Class IV girls. The step wise multiple regression analysis revealed that the nine variables, CTMM Total, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total, MRT Sentences, MRT Copying, and MAT Reading, predicted the criterion with the same degree of accuracy as the multiple R.

8. Hypothesis eight. The multiple correlation coefficient did not support the hypothesis that a significant relationship existed between the predictor variables and the criter on variable reading achievement for the total sample of Social Class V boys. The step wise multiple regression analysis revealed that the independent variables were not potent predictors of the criterion.

9. Hypothesis nine. The multiple correlation coefficient did not support the hypothesis that a significant relationship existed between the predictor variables and the criterion variable reading achievement for the total

sample of Social Class V girls. The step wise multiple regression analysis revealed that the independent variables were not potent predictors of the criterion.

Conclusions

The following conclusions were derived from the results for the samples investigated in this research. These conclusions were advanced with the caution that care should be taken in generalizing to Mexican-American students not similar to the sample utilized in this investigation.

1. On the basis of these results, the researcher concluded that CTMM Non Language, CTMM Total Data, and MRT Numbers could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American boys from lower socioeconomic levels (Social Classes IV and V).

2. On the basis of these results, the researcher concluded that CTMM Total Data and MRT Total Data could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American students from Social Class IV.

3. On the basis of these results, the researcher concluded that CTMM Total Data, CTMM Non Language, CTMM Language, MAT Word Discrimination, MAT Word Knowledge, MRT Total Data, MRT Sentences, MRT Copying, and MAT Reading could be considered as meaningful predictors of the end of third grade reading achievement for Mexican-American girls from Social Class IV.

Recommendations for Future Research

The following recommendations for further research are suggested:

1. This study should be replicated with different samples of Mexican-American students in different geographic locations, for the purpose of ascertaining the applicability of the conclusions derived from this investigation.

2. Studies investigating the educational differences between the upper, middle, and lower socioeconomic levels of the Mexican-American population should be conducted.

3. Comparative studies exploring the relative effects of the variables of socioeconomic level and sex for Mexican-American, Anglo-American, Afro-American, and other ethnic groups, as related to educational achievement, should be conducted.

Recommendations for Practice

The following recommendations for educational practice are suggested:

1. The establishment of preschool language development or readiness programs for Mexican-American students from lower socioeconomic levels. Such programs should prove especially beneficial for Social Class IV boys and Social Class V boys and girls.

2. A highly concentrated language enrichment program should become a part of the elementary school educational

curriculum for Mexican-American students from lower socio-economic levels.

3. Educational programs should be provided which are aimed at enriching the experiential background of Mexican-American students from lower socioeconomic levels.

4. A program involving parents in the educational process of their children should be conducted with parents of Mexican-American students from lower socioeconomic levels. Additionally, such a program could improve cooperation between home and school, develop more positive attitudes of parents and students toward education, and assist parents in discovering ways in which they could facilitate the educational process of their children.

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APPENDIX A

APPENDIX A

I. The Scale Scores

To determine the social position of an individual or of a household, two items are essential: (1) the precise occupational role the head of the household performs in the economy; and (2) the amount of formal schooling he has received. Each of these factors is then scaled according to the following system of scores:

A. The Occupational Scale

1. Higher Executives, Proprietors of Large Concerns, and the Major Professionals

a) Higher Executives

Bank Presidents, Vice Presidents
Judges (Superior Courts)
Large Businesses, e.g., Directors, Presidents, Vice Presidents, Asst. Vice Presidents, Executive Secretary, Treasurer

Military, Commissioned Officers, Major and above
Officials of the Executive Branch of Government, Federal, State, Local, e.g., Mayor, City Manager, City Plan Director
Internal Revenue Directors
Research Directors, Large Firms

b) Large Proprietors (Value over $100,000)

Brokers
Contractors
Dairy Owners
Lumber Dealers

c) Major Professionals

Accountants (C.P.A.)
Actuaries
Agronomists
Architects
Economists
Engineers (Coll. Grad.)
Foresters
Geologists

- Artists, Portrait
- Astronomers
- Auditors
- Bacteriologists
- Chemical Engineers
- Chemists
- Clergy (Professionally trained)
- Dentists
- Lawyers
- Metallurgists
- Physicians
- Physicists, Research
- Psychologists, Practicing
- Symphony Conductor
- Teachers, University, College
- Veterinarians (Veterinary Surgeons)

2. Business Managers, Proprietors of Medium Sized Businesses, and Lesser Professionals

a) Business Managers in Large Concerns

- Advertising Directors
- Branch Managers
- District Managers
- Brokerage Salesmen
- Executive Assistants
- Executive Managers
- Govt. Officials minor, e.g., Internal Revenue Agents
- Farm Managers
- Office Managers
- Personnel Managers
- Police Chief, Sheriff
- Postmaster
- Production Manager
- Sales Engineers
- Sales Managers, National Concerns
- Sales Managers (over $100,000)

b) Proprietors of Medium Sized Business (Value $35,000-$100,000)

- Advertising Owners ($100,000)
- Clothing Store Owners ($100,000)
- Contractors ($100,000)
- Express Company Owners ($100,000)
- Fruits, Wholesale ($100,000)
- Furniture Business ($100,000)
- Jewelers ($100,000)
- Labor Relations Consultants
- Manufacturer's Representatives
- Poultry Business ($100,000)
- Purchasing Managers
- Real Estate Brokers ($100,000)
- Rug Business ($100,000)
- Store Owners ($100,000)
- Theater Owners ($100,000)

c) Lesser Professionals

- Accountants (not C.P.A.)

- Chiropodists
- Chiropractors
- Correction Officers
- Director of Community House
- Engineers (not coll. grad.)
- Finance Writers
- Health Educators
- Librarians
- Military, Commissioned Officers, Lts., Capts.
- Musicians (Symphony Orchestra)
- Nurses
- Opticians
- Pharmacists
- Public Health Officers (M.P.H.)
- Research Assistants, University (full time)
- Social Workers
- Teachers (elementary and High)

3. Administrative Personnel, Small Independent Businesses, and Minor Professionals

a) Administrative Personnel

- Advertising Agents
- Chief Clerks
- Credit Managers
- Insurance Agents
- Managers, Department Stores
- Passenger Agents--R.R.
- Private Secretaries
- Purchasing Agents
- Sales Representatives
- Section Heads, Federal, State, and Local Govt. Offices
- Section Heads, Large Businesses and Industries
- Service Managers
- Store Managers (chain)
- Traffic Managers

b) Small Business Owners ($6,000-$35,000)

- Art Gallery
- Auto Accessories
- Awnings
- Bakery
- Beauty Shop
- Boatyard
- Brokerage, Insurance
- Car Dealers
- Cattle Dealers
- Feed
- Finance Co., Local
- Fire Extinguishers
- 5 & 10
- Florist
- Cigarette Machines
- Cleaning Shops
- Clothing
- Coal Business
- Convalescent Homes
- Decorating
- Dog Supplies
- Dry Goods
- Engraving Business
- Monuments
- Package Store (Liquor)
- Painting Contracting

Food Equipment
Food Products
Foundry
Funeral Directors
Furniture
Garage
Gas Station
Glassware
Grocery-General
Hotel Proprietors
Inst. of Music
Jewelry
Machinery Brokers
Manufacturing
Plumbing
Poultry Producers
Publicity & Public Relations
Real Estate
Records and Radios
Restaurant
Roofing Contractor
Shoe
Signs
Tavern Taxi Company
Tire Shop
Trucking
Trucks and Tractors
Upholstery
Wholesale Outlets
Window Shades

c) Semi-Professionals

Actors and Showmen
Army M/Sgt.; Navy C.P.O.
Artists, Commercial
Appraisers (Estimators)
Clergymen (not professionally trained)
Concern Managers
Deputy Sheriffs
Dispatchers, R.R. Train
Interior Decorators
Interpreters, Court
Laboratory Assistants
Landscape Planners
Morticians
Oral Hygienists
Photographers
Physio-therapists
Piano Teachers
Radio, T.V. Announcers
Reporters, Court
Surveyors
Title Searchers
Tool Designers
Travel Agents
Yard Masters, R.R.

d) Farmers

Farm Owners ($25,000-$35,000)

4. Clerical and Sales Workers, Technicians, and Owners of Little Businesses (Value under $6,000)

a) Clerical and Sales Workers

Bank Clerks and Tellers
Bill Collectors
Factory Storekeeper
Factory Supervisor

Bookkeepers
Business Machine Operators, Offices
Claims Examiners
Clerical or Stenographic
Conductors, R. R.
Employment Interviewers
Route Managers
Sales Clerks
Shipping Clerks
Supervisors Utilities, Factories
Toll Station Supervisors
Warehouse Clerks

b) Technicians

Dental Technicians
Draftsmen
Driving Teachers
Expeditor, Factory
Experimental Tester
Instructors, Telephone Co., Factory
Inspectors, Weights, Sanitary, R.R., Factory
Investigators
Laboratory Technicians
Locomotive Engineers
Operators, P.B.X.
Proofreaders
Safety Supervisors
Supervisors, Maintenance
Technical Assistants
Telephone Co. Supervisors
Timekeepers
Tower Operators, R.R.
Truck Dispatchers
Window Trimmers (Store)

c) Owners of Little Businesses

Flower Shop ($3,000-$6,000)
Newsstand ($3,000-$6,000)
Tailor Shop ($3,000-$6,000)

d) Farmers

Owners ($10,000-$20,000)

5. Skilled Manual Employees

Auto Body Repairers
Bakers
Barbers
Blacksmiths
Bookbinders
Boilermakers
Brakemen, R.R.
Brewers
Bulldozer Operators
Butchers
Cabinet Makers
Machinists (Trained)
Maintenance Foremen
Installers, Electrical Appliances
Masons
Masseurs
Mechanics (Trained)
Millwrights
Moulders (Trained)
Painters
Paperhangers

Carpenters
Casters (Founders)
Cement Finishers
Cheese Makers
Chefs
Compositors
Diemakers
Diesel Engine Repair & Maintenance (Trained)
Diesel Shovel Operators
Electricians
Electrotypists
Engravers
Exterminators
Fitters, Gas, Steam
Firemen, City
Firemen, R.R.
Foremen, Construction
Dairy
Gardeners, Landscape (Trained)
Gauge Makers
Glassblowers
Glaziers
Hair Stylists
Heat Treatments
Horticulturists
Linemen, Utility
Linoleum Layers (Trained)
Linotype Operators
Lithographers
Locksmiths
Loom Fixers
Patrolmen, R.R.
Pattern and Model Makers
Piano Builders
Piano Tuners
Policemen, City
Postmen
Printers
Radio, T.V., Maintenance
Repairmen, Home Appliances
Rope Splicers
Sheetmetal Workers (Trained)
Shipsmiths
Shoe Repairmen (Trained)
Stationery Engineers (Licensed)
Stewards, Club
Switchmen, R.R.
Tailors (Trained)
Teletype Operators
Toolmakers
Track Supervisors, R.R.
Tractor-Trailer Trans.
Typographers
Upholsterers (Trained)
Watchmakers
Weavers
Welders
Yard Supervisors, R.R.

Small Farms

Owners (under $10,000)
Tenants who own farm equipment

6. Machine Operators and Semi-Skilled Employees

Aides, Hospital
Apprentices, Electricians, Printers, Steamfitters, Toolmakers
Practical Nurses
Pressers, Clothing
Pump Operators
Receivers and Checkers

Assembly Line Workers
Bartenders
Bingo Tenders
Building Superintendents (Cust.)
Bus Drivers
Checkers
Coin Machine Fillers
Cooks, Short Order
Delivery Men
Dressmakers, Machine
Elevator Operators
Enlisted Men, Military Services
Filers, Benders, Buffers
Foundry Workers
Garage and Gas Station Assistants
Greenhouse Workers
Guards, Doorkeepers, Watchmen
Hairdressers
Housekeepers
Meat Cutters and Packers
Meter Readers
Operators, Factory Machines
Oilers, R.R.
Roofers
Set-Up Men, Factories
Shapers
Signalmen, R.R.
Solderers, Factory
Sprayers, Paint
Steelworkers (Not Skilled)
Stranders, Wire Machines
Strippers, Rubber Factory
Taxi Drivers
Testers
Timers
Tire Moulders
Trainmen, R.R.
Truck Drivers, General
Waiters-Waitresses ("Better Places")
Weighers
Welders, Spot
Winders, Machine
Wiredrawers, Machine
Wine Bottlers
Wood Workers,
Wrappers, Stores and Factories

Farmers

Small tenants who own little equipment

7. Unskilled Employees

Amusement Park Workers (Bowling Alley, Pool Rooms)
Ash Removers
Attendants, Parking Lots
Cafeteria Workers
Car Cleaners, R.R.
Car Helpers, R.R.
Carriers, Coal
Countermen
Dairy Workers
Messengers
Platform Men, R.R.
Peddlers
Porters
Roofer's Helpers
Shirt Folders
Shoe Shiners
Sorters, Rag and Salvage
Stagehands
Stevedores
Stock Handlers

Deck Hands
Domestics
Farm Helpers
Fishermen (Clam Diggers)
Freight Handlers
Garbage Collectors
Grave Diggers
Hod Carriers
Hog Killers
Hospital Workers (Unspecified)
Hostlers, R.R.
Janitors, Sweepers
Laborers, Construction
Laborers, Unspecified
Laundry Workers
Street Cleaners
Unskilled Factory Workers
Truckmen, R.R.
Waitresses ("Hash Houses")
Washers, Cars
Woodchoppers

Relief, Public, Private

Unemployed (No Occupation)

Farmers

Share Croppers

This scale is premised upon the assumption that occupations have different values attached to them by the members of our society. The hierarchy ranges from the low evaluation of unskilled physical labor toward the more prestigeful use of skill, through the creative talents of ideas, and the manipulation of men. The ranking of occupation functions implies that some men exercise control over the occupational pursuits of other men. Normally, a person who possesses highly trained skills has control over several other people. This is exemplified in a highly developed form by an executive in a large business enterprise who may be responsible for decisions affecting thousands of employees.

B. The Educational Scale

The educational scale is premised upon the

assumption that men and women who possess similar educations will tend to have similar tastes and similar attitudes, and they will also tend to exhibit similar behavior patterns. The educational scale is divided into seven positions: (1) Graduate Professional Training (persons who complete a recognized professional course leading to a graduate degree are given scores 1). (2) Standard College or University (all individuals who complete a four-year college or university course leading to a recognized college degree are assigned to the same scores. No differentiation is made between state universities or private colleges). (3) Partial College Training (individuals who complete at least one year but not a full college course are assigned this position. Most individuals in this category complete from one to three years of college). (4) High School Graduates (all secondary school graduates, whether from a private preparatory school, a public high school, a trade school, or a parochial high school, are assigned the same scale value). (5) Partial High School (individuals who complete the tenth or the eleventh grades, but do not complete high school are given this score). (6) Junior High School (individuals who complete the seventh grade through the ninth grade are given this position). (7) Less Than Seven Years of School (individuals who do not complete the seventh grade are given the same scores, irrespective of the amount of education they receive).

II. Integration of Two Factors

The factors of Occupation and Education are combined by weighting the individual scores obtained from the scale positions. The weights for each factor were determined by multiple correlation techniques. The weight for each factor is:

Factor	Factor Weight
Occupation	7
Education	4

To calculate the Index of Social Position score for an individual, the scale value for Occupation is multiplied by the factor weight for Occupation, and the scale value for Education is multiplied by the factor weight for Education. For example, John Smith is the manager of a chain supermarket. He completed high school and one year of business college. His Index of Social Position score is computed as follows:

Factor	Scale Score	Factor Weight	Score x Weight
Occupation	3	7	21
Education	3	4	12
		Index of Social Position Score:	33

APPENDIX B

APPENDIX B

The Two Factor Index of Social Position scores may be arranged on a continuum or divided into groups of scores. The range of scores on the continuum is from a low of 11 to a high of 77. For some purposes a researcher may desire to break the continuum into a hierarchy of score groups. We have found that the most meaningful breaks for the purpose of predicting the social-class position of an individual or of a nuclear family are as follows:

Range of Computed Scores	Social Class
11-17	I
18-27	II
28-43	III
44-60	IV
61-77	V

A detailed description of the Two Factor Index and its determination can be obtained from August B. Hollingshead, Two Factor Index of Social Position (copyrighted 1957), privately printed, 1965 Yale Station, New Haven, Connecticut.

APPENDIX C

APPENDIX C

A COMPUTER PROGRAM FOR A STEP WISE MULTIPLE REGRESSION ANALYSIS

This program is designed to perform a multiple regression analysis (MRA). Following this, the variables are selected according to their predictive powers and successive MRAs are performed. The first of these analyses includes only the most potent variable; the second the two most potent variables; and so on until all the variables are again included in the MRA. This procedure results in a step wise multiple regression analysis (SWMRA).

The predictive potency of the variables is determined on the basis of their standard partial regression coefficients (beta weights). This procedure was also used by Berglund (1965) and a mathematical justification is given by Steele and Torrie (1960). However, Cooley and Lohnes (1962) indicate that selection of variables on this basis may lead to conclusions which lack generality. However, frequently the practical demands of research require the investigator to select only a portion of the tests or measurements in the population of tests. This procedure would appear to be the most logical in this case even though it has certain inherent dangers.

This program is a modification of the I.B.M.

Scientific Subroutine Package (SSP) sample program, "Regre". The "Multr" subroutine is modified to compute the beta weight for each independent variable and a simplified F-test of the correlation coefficient is introduced (Guilford, 1965). All other SSP subroutines are left unchanged.

The output of the program includes an inter-correlation matrix (IM), an MRA, an SWMRA, and a table of residuals (TR) for each MRA and SWMRA.

Both the MRA and the SWMRA list for each independent variable, the mean, standard deviation, correlation coefficient with the dependent variable, regression coefficient, beta weight, standard error of the regression coefficient, t-value for the significance of the regression coefficient (H_o:reg. coef. = 0), and the degrees of freedom for the t-test. These analyses also list the mean and standard deviation of the dependent variable, the intercept constant for the regression equation, the multiple correlation coefficient, the standard error of estimate for the multiple R, an F-ratio testing the significance of the multiple R (H_o: R = 0), and the degrees of freedom for the F-ratio. The SWMRA also lists an F-ratio testing the difference between the MRA multiple correlation coefficient and the SWMRA multiple correlation coefficient (H_o: $R_{mra} = R_{swmra}$; Guilford, 1965).

The program provides several analysis options. The user can choose the IM only option; the IM, MRA option; the IM, MRA, TR option; the IM, MRA, SWMRA option; or the IM, MRA, SWMRA, TR option. Specific instructions regarding the selection of these options is found in the program listing.

Any number of data decks can be analyzed. Each deck to be analyzed must consist of three parts in the following order; a control card, a data deck, and the selection cards. The control card provides the computer with information regarding the number of observations, number of variables etc. The selection cards specify which variables are to be used in the analysis and order in which they are used etc. A selection card is required for each separate analysis to be performed on a given data deck. For example, the user may have two dependent variables and may wish a separate MRA on each. Thus, he would prepare two selection cards. Specific instructions on the preparation of the control and selection cards is found in the program listing and the SSP manual (pp 290-291).

Before the program can be used, format statement one in the subroutine "Data" must be modified to fit the data card format.

REFERENCES

Berglund, J. V. Multiple Regression and Correlation. Syracuse, N. Y.: State University of New York Press, 1965.

Cooley, W. W. & Lohnes, P. R. Multivariate Procedures for the Behavioral Sciences. New York: John Wiley and Sons, 1962.

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System/360 Scientific Subroutine Package Version II Programmer's Manual. 1967.

Steele & Torrie (see Berglund for exact reference) 1960. Principles and Procedures of Statistics.